WOODWORKER'S TRAVEL GUIDE 12 Top Destinations Page 74

Better Homes and Gardens®

WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

ISSUE 120 WINTER 1999

ALL-BUSINESS PORTABLE PLANERS

Side-by-side tests of 10 models reveal the top performers

Page 56

Great Winter Projects

- Apothecary Cabinet
- Country-Style Writing Desk
- Three Classy Cutting Boards
- Arts And Crafts Picture Frame
- Whole-Shop Air-Cleaning System

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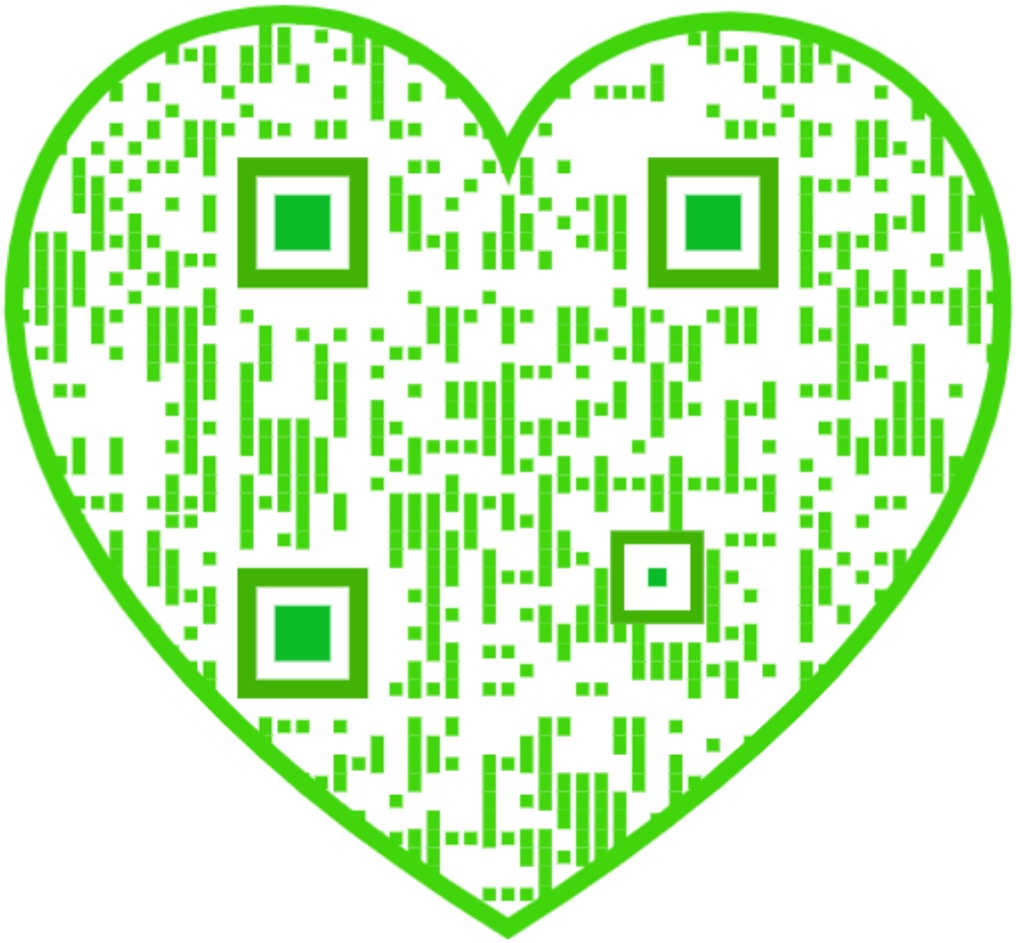

ISSUE NO. 120 WINTER 1999
This issue's cover wood grain: cottonwood

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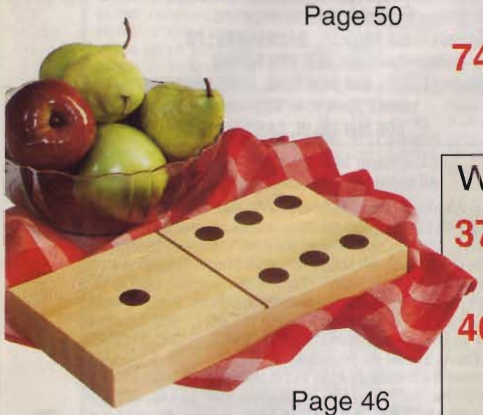

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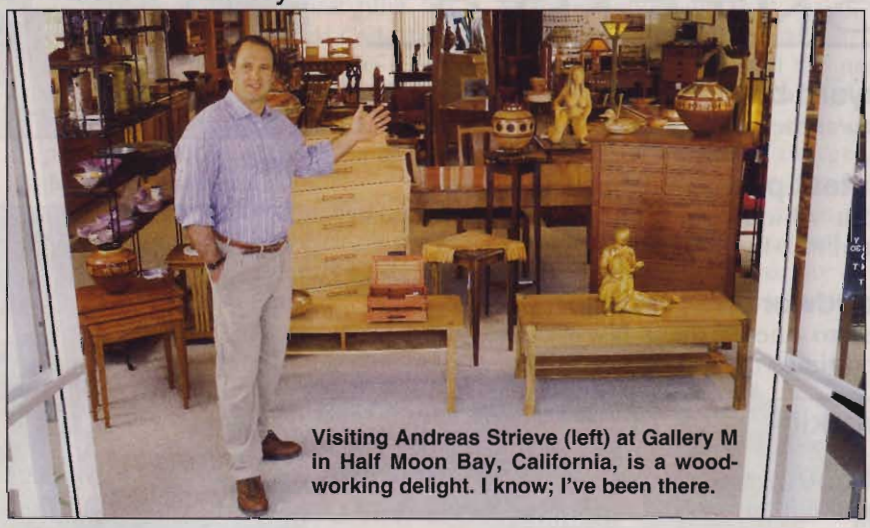
THE EDITOR'S ANGLE

Working Hard For Woodworkers Everywhere

A Salute to Gallery Owners!



Visiting Andreas Strieve (left) at Gallery M in Half Moon Bay, California, is a woodworking delight. I know; I've been there.

Recently, I visited with a couple of really nice guys who have dedicated themselves to showcasing the efforts of woodworkers. I'm talking about Andreas Strieve, the proprietor of Gallery M in Half Moon Bay, California, and Bruce Abbott, who operates One of A Kind Gifts in Ghirardelli Square in San Francisco. That's Andreas in the photo *above*.

In talking with both of these people, it became obvious that they believe deeply in what they're doing. When either of them talk about one of the pieces they have on display, they inevitably tell a story about the woodworker who made the item and talk about what kinds of woods were used. You can sense their enthusiasm and pride.

Whether we realize it or not, Andreas and Bruce are an important part of a small network of galleries around the country that represent woodworkers everywhere to the general public. There is a tremendous amount of top-quality woodworking being done these days in this country and elsewhere, and most of it doesn't get the exposure it deserves. Thanks, guys, for what you so lovingly do.

To help give woodworking galleries nationwide a higher profile, we're compiling a list of them with help from the Rosen Group, publishers of *Niche* magazine, and the folks at *The Crafts Report*, a crafts-industry publication. As soon as we have all the information together, we'll publish the results. So when you're out and about, you can factor some of these galleries into your itinerary.

I know they'll appreciate having you come in, take a look around, and perhaps purchase one or more of their offerings. By doing this, you'll be helping support the efforts of those who are working to showcase fine handmade items from some of North America's best artisans.

Attention gallery owners, woodworking professionals, and readers: We need your help in compiling our list of woodworking galleries. If you know about one or more establishments you think we should include, drop me a letter or send me an e-mail. Please send your recommendations to:

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or e-mail: lclayton@mdp.com

Larry Clayton

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TALKING BACK

A couple of cupping corrections

On page 6 of issue 115, you have the wrong explanation for why wood cups. Lumber always cups to the bark side, so your illustration is correct. But you should have said, "...the face of the board that was closer to the center of the tree has more radial grain and less movement, whereas the other face that was toward the outside of the tree has more tangential grain, which moves more."

—Eugene M. Wengert, Madison, Wis.

One small correction to the "Talking Back" entry about cupping in issue 115: The tangential surface shrinks about twice as much as the radial surface. Otherwise, I have been a subscriber since 1991, and your projects have given me many ideas. The articles are very informative, too. Keep up the good work.

—Kevin Cox, Rhodes, Iowa

Get right to the point with blade angle

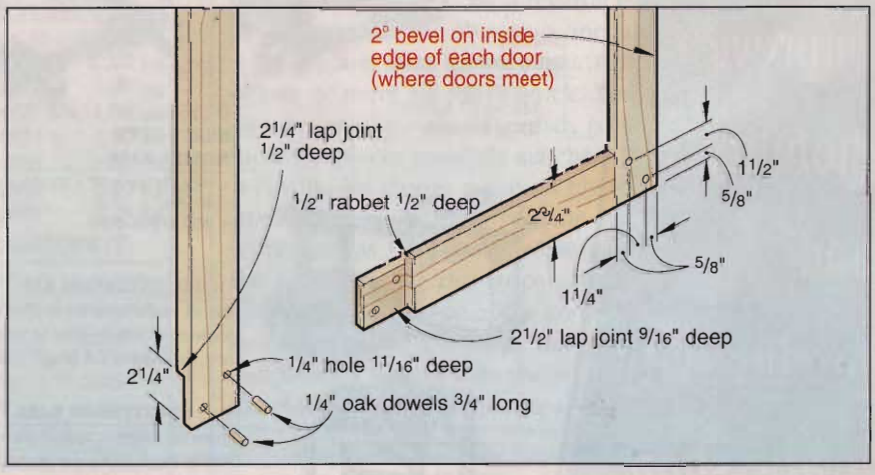
This is the first time that I have felt obliged to write concerning one of your plans. The Bandsaw Multi-Jig Circle-Cutting guide in issue #113 leaves out a critical bit of information regarding positioning the trammel point. The trammel point must be exactly perpendicular to the bandsaw blade's tooth tips or the circles attempted won't be perfectly sized. I learned this the hard way with a temporary jig.

—Verne Giddings, Bothell, Wash.

You have a point, Verne, and we apologize for your inconvenience. It is important that the angle of the trammel be 90° from the front edge of the blade. However, if you follow the instructions given in the article on page 63 under the heading "Here's how to set the blade guides," that will happen automatically.

Beveled backward

In the Arts-and-Crafts Bookcase project, issue #116, reverse the bevel location called for in the drawing on page 69. In the exploded view of the door, it reads "2° bevel on outside edges of each door." Change that to "2° bevel on *inside* edge of each door," as shown *below*. Also, the dadoes in parts U and V should be ½" by ¼" deep, not ¼" dadoes ¼" deep.



We would like to hear from you

We welcome your comments, criticisms, suggestions, and yes, even compliments. We'll publish letters of the greatest benefit to our readers. Write to: Talking Back, *WOOD* Magazine, 1716 Locust St., GA310, Des Moines, IA 50309-3023

Continued on page 6

Continued from page 4

Rockwell hardness tester proves to be family

Imagine how surprised I was when I turned to page 4 of issue #116 and saw a Rockwell Hardness tester. Stanley P. Rockwell, my father, invented the tool. And I spent 22 years of my business life selling, servicing, and improving it. I am now 86 years old and still get a kick out of talking to people familiar with the hardness tester.

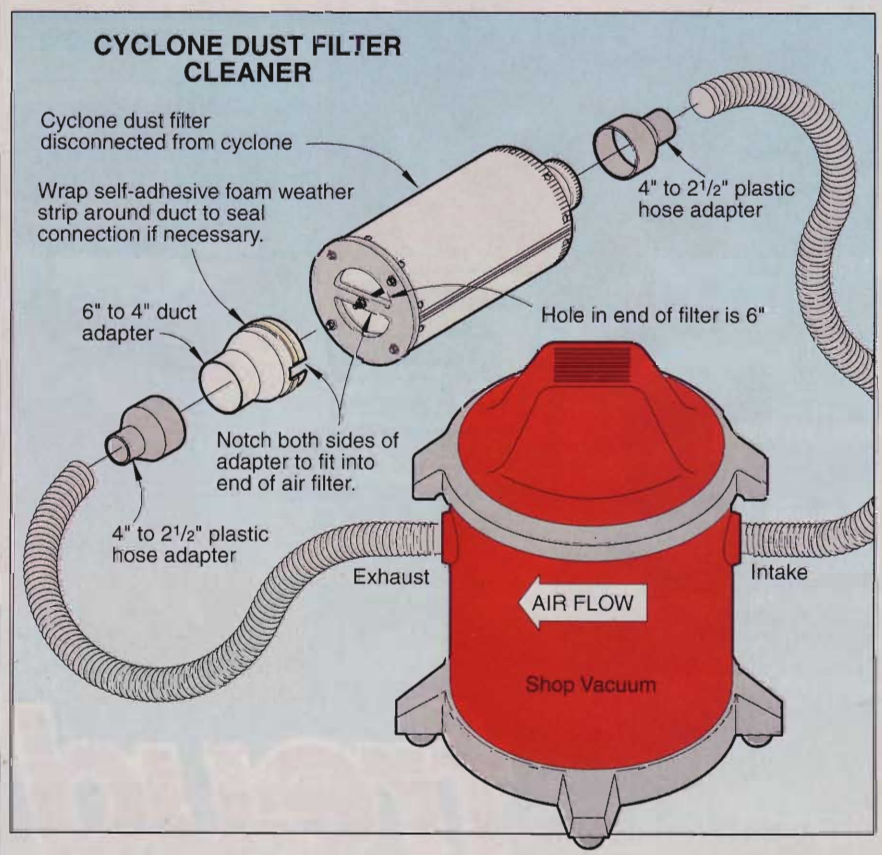
Since I retired in 1974, I have been active making furniture and other items. Except for *WOOD®* magazine, I have given up all my other woodworking magazine subscriptions.

—Dudley W. Rockwell, Cushing, Maine

Back-flush Cyclone, too

Thanks for the great Cyclone Dust Collector project. Your choice of a NAPA air filter was excellent. I have been using this set-up to back-flush it and extend its life: I disconnected the filter and installed several adapters so that I can connect inlet and outlet hoses of my shop vacuum. The closed-loop system effectively cleans the filter without disassembly and a dusty mess.

—Ken Gossage, Bellevue, Wash.


CYCLONE DUST FILTER CLEANER
Cyclone dust filter disconnected from cyclone
Wrap self-adhesive foam weather strip around duct to seal connection if necessary.
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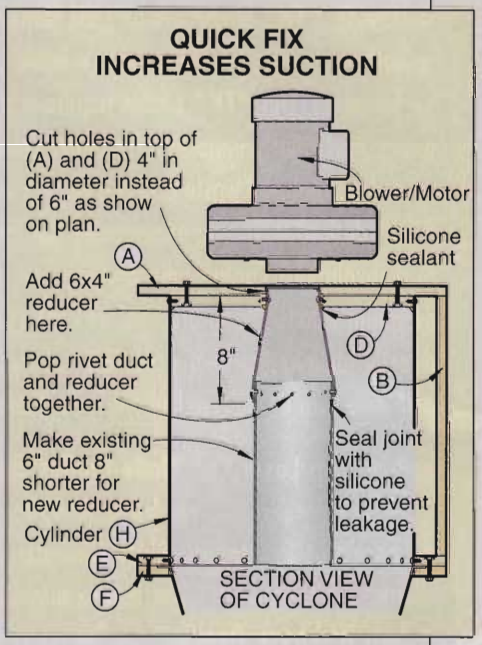
Hole in end of filter is 6"
Notch both sides of adapter to fit into end of air filter.
4" to 2½" plastic hose adapter
Exhaust
Intake
AIR FLOW
Shop Vacuum

Gain static pressure with reducer

Congratulations on your Cyclone Dust Collector design in issue #100. I built the collector and was impressed with the clear instructions. As a retired mechanical engineer, I do have one suggestion. I calculated the static pressure (S.P.) in order to size the ductwork, and discovered a drop of .85" S.P. at the abrupt exit from the collector to the fan inlet. By installing a 6x4" reducer fitting before exiting the dust collector, I saved approximately .72" S.P.

—Albert J. Cappelloni, Scranton, Pa.



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A Pair of Fast Finishes For Small Turnings

When it comes to finishing pens, bowls, and many other small turnings, you won't find any easier way than applying the finish while the project spins on the lathe. Here are two finishes made just for that.

Shellac, denatured alcohol, and boiled linseed oil make an easy-to-apply finish for bowls and other small turnings. Hut Wood Finish sticks, left front, are ideal for small spindle turnings and pens.

Finish with a French accent

A liquid finish variously referred to as French finish, turner's finish, or padding lacquer gives turned work a rich, satin luster. A variation on the true French polish process, this technique dates far back into history.

You can buy a ready-to-use finish such as French Polish (available from Craft Supplies USA, 800/551-8876) or make your own. For a home-brew finish, mix equal parts of shellac, denatured alcohol, and boiled linseed oil.

If you make your own shellac from flakes (shown in front in the photo at top right), mix 2 pounds of flakes into a gallon of denatured alcohol for a two-pound cut. (Or mix ¼ pound into a pint for a smaller quantity.) Shellac and turner's finish work best when fresh, so mix small amounts.

Whichever formulation you use, application is straightforward. After sanding the turning to at least 220-grit, clean off all dust. Then fold clean, soft cotton fabric into a pad several layers thick and about 3×5".

Dampen the pad with the finish. Then, with the lathe running at about 2000 rpm, press the dampened pad against the bottom of the workpiece, as shown *below*. Lay the pad on your fingertips and grip it with your thumb, keeping your fingers and thumb pointing in the direction of lathe rotation. You want the pad to be able to pull free from your hand if it catches on the turning.

Press the pad against the work with moderate pressure, and move it from side to side for even coverage. Heat generated by friction dries the finish almost instantly, so you can assess your results as you go. Build up several light applications to achieve the best results.

A quick, solid finish

We like turner's finish for decorative bowls, plates, vases, and other vessels. For small turnings, like pens, pencils, and similar projects, though, we prefer HUT Wood Finish (available from HUT Products for Wood, 800/547-5461, or Craft Supplies USA). This proprietary blend of waxes and polishing compounds comes in stick form, making application neat and virtually foolproof.

Hut offers three varieties—HUT Wood Finish, a satin finish for general lathe work; Perfect Pen Polish, a satin finish formulated for pens; and high-gloss Perfect Pen Polish. You apply all three the same way.

Run the lathe at 2500 rpm or faster (or the highest speed that's safe for the size of your workpiece). Then,

Apply liquid polish with the lathe running, but keep your fingers pointed in the direction of rotation, and don't wrap the cloth around your hand.

HUT finish polishes out sanding scratches, making it a particularly effective finish for acrylic-stabilized burl like these turnings. Compare the polished and buffed part at far left with the unfinished end at far right.

starting at one end of the turning, press the stick of finish against the surface, as shown in the photo at *bottom right* on *page 8*. Move it slowly toward the other end, covering the surface evenly. Apply the stick to the lower portion of the turning, where it's rotating away from you.

Next, rub a cloth pad or crumpled-up paper towel hard against the rotating object to burnish the finish, as shown *below*. The heat of friction melts the finish into the surface, and the pad picks up the excess. As with the French polish, hold the pad in such a way that it will pull free of your hand instantly if it snags on the turning. After burnishing, buff the rotating turning with a clean pad.

Run the lathe fast to polish the HUT finish; heat generated by friction helps shine it up. Hold the pad loosely so it will pull free of your hand if it catches.

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Are You Stumped?

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Dueling crosscuts: Radial-arm saws versus sliding compound mitersaws

I'm in the market for a sliding compound mitersaw, but wondered about the advantages and disadvantages of these compared to a radial-arm saw. If I do buy a slider, is it worth going to a 12" blade size?

Byron Trantham, Fredericksburg, Va.

Byron, we took an in-depth look at sliding compound mitersaws in issue #87 of *WOOD*® magazine (*see photo at right*), but don't mind at all offering an update for you. The basics haven't changed much—portability, accuracy, and reasonable cost still rank as key virtues of sliding mitersaws, combined in a package no radial-arm saw can quite match. The cutting method—pushing the blade into the stock rather than pulling it through—also offers a slight safety advantage. Industrial-duty radial-arm saws are highly accurate, but their larger bulk and heftier price tags ($1,500 and up) can't compete with today's lightweight and precise sliders, which sell for $400-650. Radial-arm saws do have the edge in versatility—they can make rip cuts, for example, and accept dado blades—though a tablesaw typically does these jobs better.

EXCLUSIVE: Router table multi-joint jig p. 50
WOOD
SLIDING COMPOUND MITERSAWS
Check out our top picks on page 40
Learn to hand-cut DOVETAILS
One easy step at a time

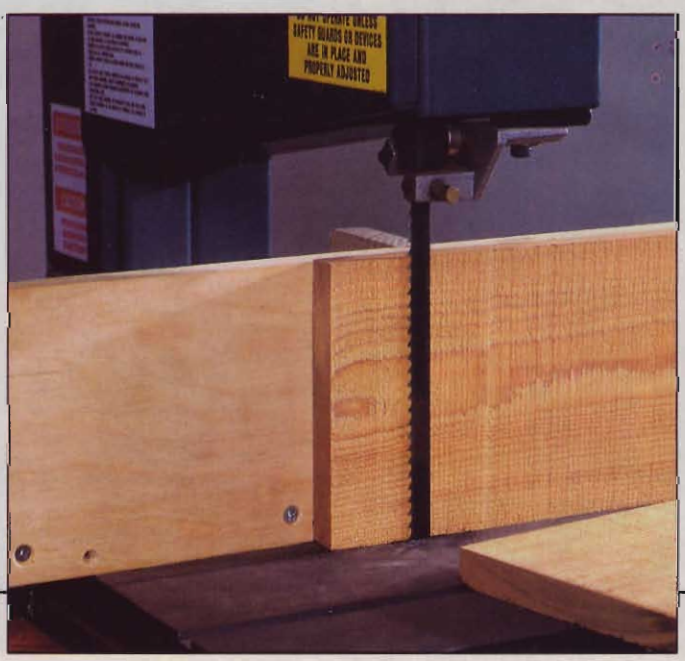
For most crosscutting and miter work, a 10" sliding mitersaw offers plenty of capacity for both width and depth of cut. You can go to a 12" saw if you want, but the extra capability will come at a price—more weight and bulk, and an additional dollar cost of $100-250.

Resawing with the bandsaw: Is a wider blade always better?

I need help sorting out conflicting advice about resawing with my bandsaw, a 14" Delta. I planned to use a ¾"-wide blade to resaw some lumber I have. The saw's manual says it will accept that size, and I've always thought the wider the better, but a local dealer told me I'd do as well or better with a ½" blade. Any advice?

Ron Bowling, Indianapolis

Your question almost always starts an opinion stampede among woodworkers, Ron, but our staff actually reached a consensus on this issue.



Better still, our preference (for the ½" blade) was confirmed when we posed the question to woodworker and author Mark Duginske, an expert on bandsaw setup and use. Here is Mark's take on it.

First concern—the ¾" blade isn't just wider, it's also thicker (.035", versus .025" for a typical ½" blade). On larger bandsaws, the bend around the wheel is more gradual, so the thicker metal can handle it. But wrapping that same blade around a 14" wheel creates a tighter bend that stresses the metal, causing premature fatigue and cracking. So you'll pay more for a blade that's likely to fail sooner.

Second, most medium-duty saw frames like yours have trouble generating and holding the increased tension necessary with thicker blades. Any accuracy you might have gained will be lost if insufficient tension allows the blade to drift within the cut.

Duginske's recommendation? Stick with a ½"-wide, 3-tpi, hook-tooth blade. Hook-tooth blades feature large curved gullets that clear chips quickly. Any more teeth than three will only result in a slower, hotter cut.

Finally, make sure the upper and lower thrust bearings (directly behind the rear edge of the blade) support the blade firmly without allowing it to deflect backward. If the blade "gives" under pressure, it will start wandering from a straight cut.

Continued on page 12

Continued from page 10

How to sharpen your own hand saws

I have some hand crosscut saws that need sharpening. I've touched up saws before, but am not sure how to set and file the teeth at the same consistent angle, or what the proper angle should be.

—Frank Sailer, Eagle River, Wis.

Before you begin to sharpen the teeth of a saw, Frank, you should first "joint" or "top" the saw. Jointing makes all of the teeth the same height. Do this by passing a flat file along the saw's edge repeatedly until you reach the lowest tips. If the saw requires a lot of jointing, you'll need to reshape some of the teeth to match the rest. A few strokes directly across the teeth with a saw file (a small, fine, triangular file) will do the trick.

Now, with the teeth jointed and shaped, you're ready to set (bend) the teeth. You'll need a plier-style or pistol-grip saw-set as shown *below left*. These tools use a metal plunger to push a tooth until it rests on an anvil that stops the bend. Adjust the depth of the saw-set to bend only the top half of the tooth.

How much you set the teeth depends on the type of wood you will be cutting. Wet wood requires a saw with more set than dry wood, and soft wood requires more set than hard. An aggressive set cuts a wider kerf (the width of the cut), which requires more effort and results in less accuracy. A saw cuts the straightest with the least amount of set. A set equal to half the thickness of the blade should be plenty for most woodworking tasks.

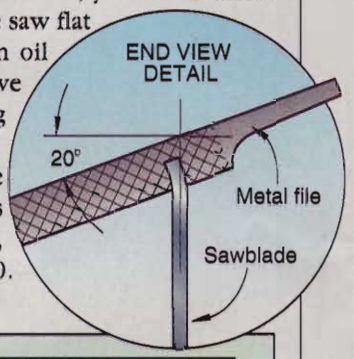
With the saw firmly in a vise, start at the front of the saw and go down the line alternately setting every other tooth to the right before turning around to bend the other half to the left. Note: never change the direction of a tooth's set, you could break it off. And try to use even pressure, squarely applied to each tooth.

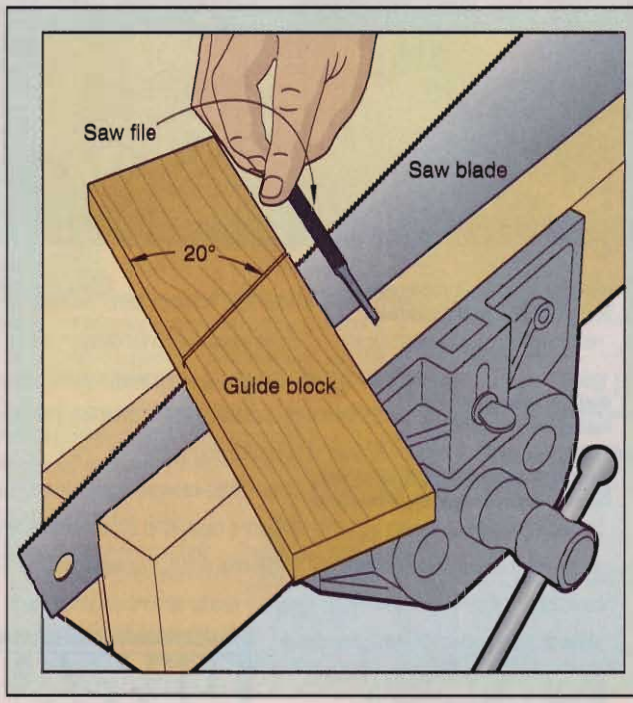
With the teeth properly set, it's time to sharpen or "point" them. A 20° bevel is typical, but depending on the intended job the bevel could be as little as 10° (similar to a rip saw) or as much as 45°, which will cut like a hot knife through butter, but require frequent resharpening. Once you've decided on the bevel angle, make a guide block by cutting the appropriate angle in the top and bottom of a small board that slips over the blade and serves as a reference to the angle of your file.

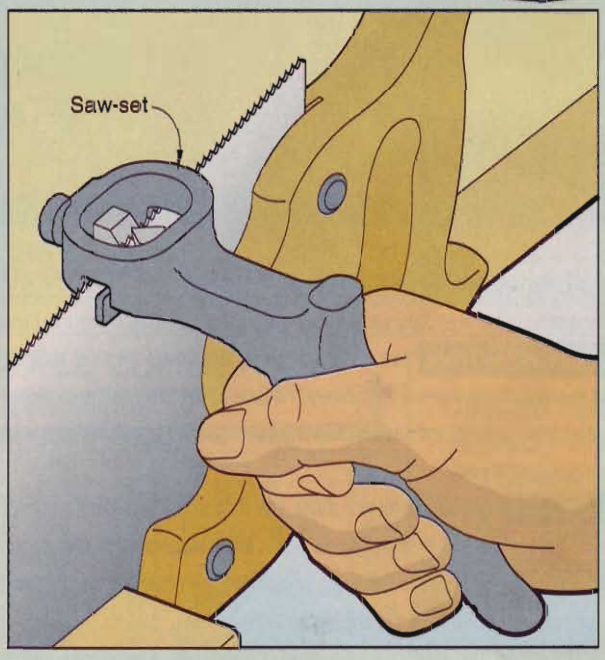
With your file lined up with your guide block, as shown *bottom right*, drop the end of the file the same angle as your bevel (see End View Detail *below*). Push forward and upwards towards the tips of the teeth, picking the file up off the saw before the backstroke. File with a smooth, firm stroke until the tooth points. In the right light it should be easy to tell which teeth have been properly pointed and which ones have not.

Any time you push metal with a file, you create a burr on the outside edge. So, lay the saw flat on a bench and gently run an oil stone across the teeth to remove that burr. Be careful; overdoing this step will remove the set.

Saw files and saw-sets are available from Lee Valley Tools Ltd., P.O. Box 1780, Ogdensburg, NY 13669-6780. Or call 800/871-8158.







Continued on page 14

Continued from page 12

Tablesaws—how do I know what type is best for me?

What's the scoop on tablesaws? I see "professional" saws selling for $1,400 and benchtop models for $195, but both are 10" saws and have the same horsepower rating. I can see paying more money for the larger cast iron table, but a $400 contractor's saw has that feature. Also, how do belt-drive and direct-drive saws compare?

Philip Morris, Katy, Texas

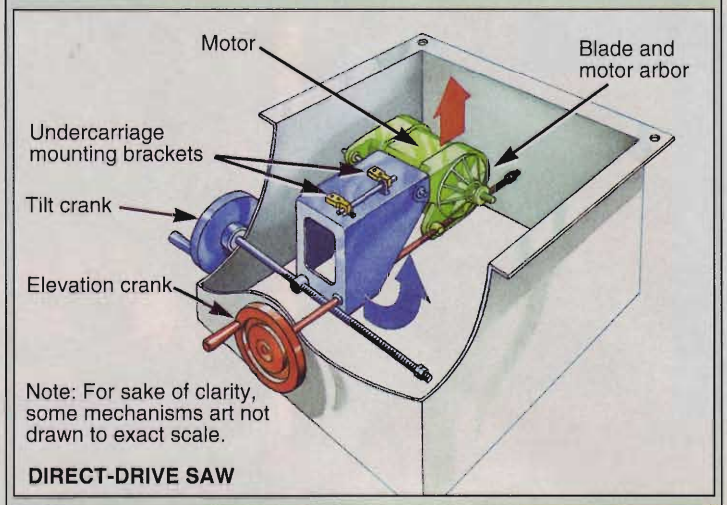
You're not alone, Philip, in your confusion about machinery features and specifications. Those numbers don't tell the whole story.

Maximum blade size determines a tablesaw's primary specification (10" being the most common), so many saws will share that trait. Horsepower ratings, however, get a little trickier because benchtop and stationary machines don't use the same kind of motor. Portable saws feature a "universal" motor, the type found in most other portable power tools. These motors are compact and lightweight, but perform best at shorter run times, more like a sprinter than a distance runner. Their rating usually reflects a "maximum developed horsepower," a burst the motor can't sustain for long periods without damaging itself.

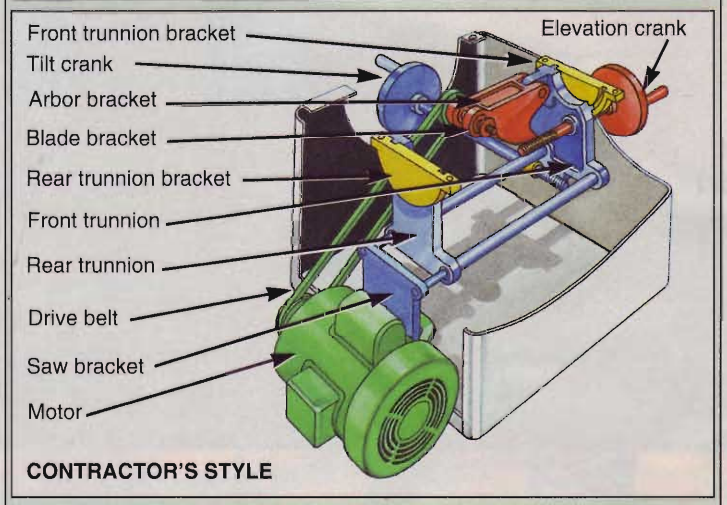
Nearly all stationary machines use induction motors, which can run longer under a load without overheating. They're also much quieter, producing a barely audible hum rather than the high-pitched whine of a universal motor. An induction motor's rating more likely reflects its "continuous" horsepower. Not only can it sustain this output, it will respond to an increased load (for example, a heavy cut in hard maple) by drawing additional current (amperage) and producing more than twice its rated horsepower. The catch? Cost, weight, and size make induction motors impractical for portable tablesaws.

Your question about direct- and belt-drive saws enters the picture here. Universal motors are small enough to use in a direct-drive mount and still allow a sizable depth-of-cut from a 10" blade. On a benchtop saw, this motor/arbor/blade assembly mounts under the table with one or more stamped steel brackets or "trunnions." With its larger diameter, an induction motor with a similar rating would limit cutting depth too severely, so the motor/blade connection is made via a separate arbor assembly and a drive belt. On a contractor's saw, a 1½-hp motor hangs from the back of the saw and drives a single belt. On a professional (cabinet-style) saw, a 3-hp, 220-volt motor hangs below the table and features multiple drive belts. Both machines feature trunnions made of cast iron (though the cabinet saw's are much heavier), so they dampen vibration and resist deflection much more than stamped-steel brackets.

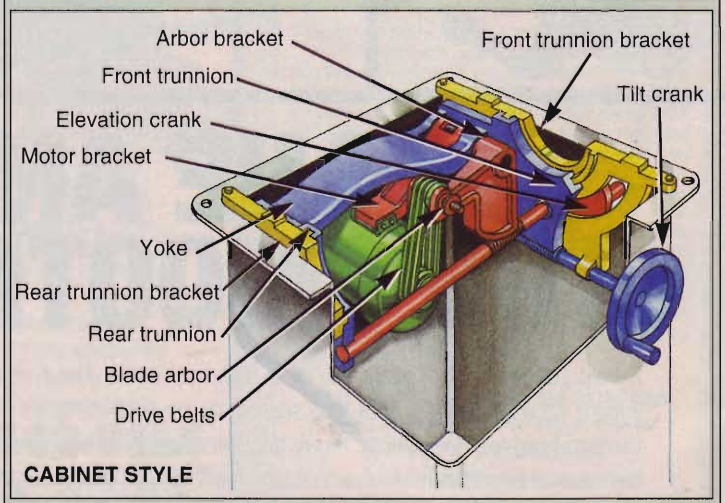
Aside from having more of the right kind of horsepower, it's this combination of rigidity and mass that really makes the difference. Benchtop tablesaws offer portability and lower cost, with some tradeoffs. Stationary saws cost you more in dollars and floor space, but they're designed to run for longer periods, handle larger stock, and withstand heavier use. These factors—and the type of woodworking you want to do—should top the list of considerations when you go shopping.


Motor
Blade and motor arbor
Undercarriage mounting brackets
Tilt crank
Elevation crank
Note: For sake of clarity, some mechanisms art not drawn to exact scale.

DIRECT-DRIVE SAW



CONTRACTOR'S STYLE



CABINET STYLE

A real stand-up fixture

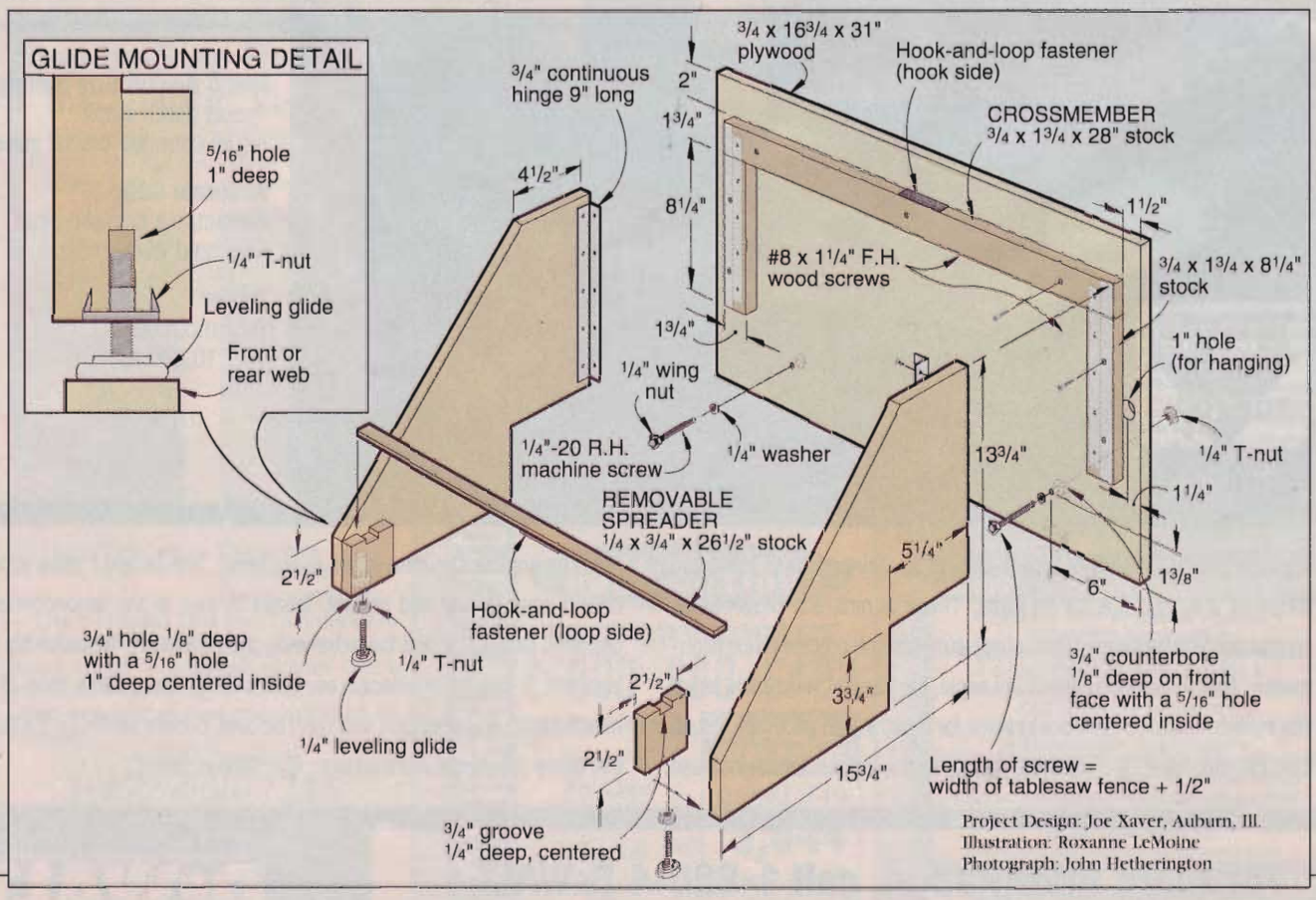
Texas-Size Tablesaw Fence

Now you can stand workpieces, such as raised panels, upright and cut their edges on your tablesaw. Just use this auxiliary tablesaw fence designed by *WOOD*® magazine reader Joe Xaver. The jig bolts temporarily to your saw's existing fence to let you make these cuts safely and accurately, and folding supports make for flat storage.

Before you begin, take a few measurements from your saw to ensure proper fit. First, examine your saw's existing fence to see if drilling it for the machine screws where shown in the drawing *below* will interfere with the fence's operation, and adjust the locations if necessary. For webbed extension wings, measure between the centers of the webs at the front and rear of the extensions. Make the removable spreader this length, and add 1½" to find the length of the crossmember. (The dimensions shown are for a table that is 26½" between the centers of the front and rear webs.) For saws with solid extension wings, shorten the dimensions shown for those pieces by 4".

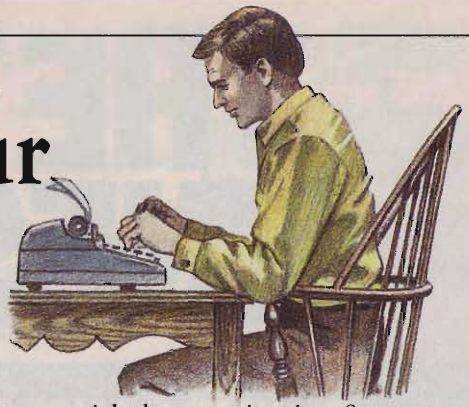
Armed with that information, build the auxiliary fence as shown in the drawing. Drill 5/16" holes in your fence to match the location of the t-nuts, and bolt the tall fence to your saw's fence as shown in the photo *above*.

Before using the jig for the first time, adjust the nylon glides so the tall fence is perpendicular to your saw's table top. When you're done, unbolt the unit from your fence, pop out the removable spreader (attach it to the top edge of the crossmember for storage), fold up the legs, and hang the whole thing on a wall.


GLIDE MOUNTING DETAIL
5/16" hole 1" deep
1/4" T-nut
Leveling glide
Front or rear web
3/4 x 16 3/4 x 31" plywood
Hook-and-loop fastener (hook side)
3/4" continuous hinge 9" long
2"
1 3/4"
8 1/4"
4 1/2"
CROSSMEMBER 3/4 x 1 3/4 x 28" stock
1 1/2"
#8 x 1 1/4" F.H. wood screws
3/4 x 1 3/4 x 8 1/4" stock
1" hole (for hanging)
1/4" wing nut
1/4"-20 R.H. machine screw
1/4" washer
13 3/4"
1/4" T-nut
1 1/4"
REMOVABLE SPREADER 1/4 x 3/4" x 26 1/2" stock
5 1/4"
6"
1 3/8"
2 1/2"
Hook-and-loop fastener (loop side)
3/4" hole 1/8" deep with a 5/16" hole 1" deep centered inside
1/4" T-nut
1/4" leveling glide
2 1/2"
2 1/2"
3 3/4"
15 3/4"
3/4" counterbore 1/8" deep on front face with a 5/16" hole centered inside
Length of screw = width of tablesaw fence + 1/2"
3/4" groove 1/4" deep, centered

Project Design: Joe Xaver, Auburn, Ill.
Illustration: Roxanne LeMoine
Photograph: John Hetherington

Let the media tell your woodworking story



When you want the public to know about your work, take a page from the pros.

If you're looking for ways to promote your woodworking, don't be too quick to reach for your wallet. The best advertising is publicity, and like some of the other best things in life, it can be free.

Getting publicity, particularly from local media, can be easier than you think. A review of the top 50 United States' newspapers in a given month will show three to five of them run a feature story about a woodworker. So, your chances aren't that bad. People find woodworking innately interesting, and to reporters, it's highly photogenic.

Get rolling with a press release

You'll find it easiest to get your news into community and neighborhood publications, although metropolitan daily newspapers, city magazines, weekly entertainment tabloids, and local TV stations are also good bets.

The best way to approach any of these news media is with a press release. Don't call reporters and editors to pitch stories about yourself. It's far more likely to cause annoyance than generate a story. Do, however, call to ask who should receive your release.

The press release should include:

- Your phone number(s) and when you can be reached.
- A photo of you and what you make, particularly for a community newspaper, which may actually run the photo you submit. Larger publications will send a professional out to take photographs.
- A one-paragraph summary of your background, including such details as past or current employment, charity work you've done, and any other note of special interest related to your woodworking.
- Some compelling news, with the first paragraph containing these essential elements: Who (you), What (your woodworking specialty), Where (shop location), When (when you did it or how long you've been at it), and Why (the "hook," see the following section).

Make yourself interesting

The "Why" of your release can be the hardest. To get the attention of the editor or reporter, you'll need a news hook. Some are simple, such as awards you won, classes you teach, or the opening of a new business.

In other cases, the hook becomes something unusual you make, such as a working wooden lock, tall clock, colorful carousel horses, or spoons. It might be your situation. Some recent feature stories in metro dailies included a husband-and-wife woodworking team in St. Louis, a Long Island periodontist with a woodworking hobby, and a semi-retired Tampa man who teaches woodworking in Belize.

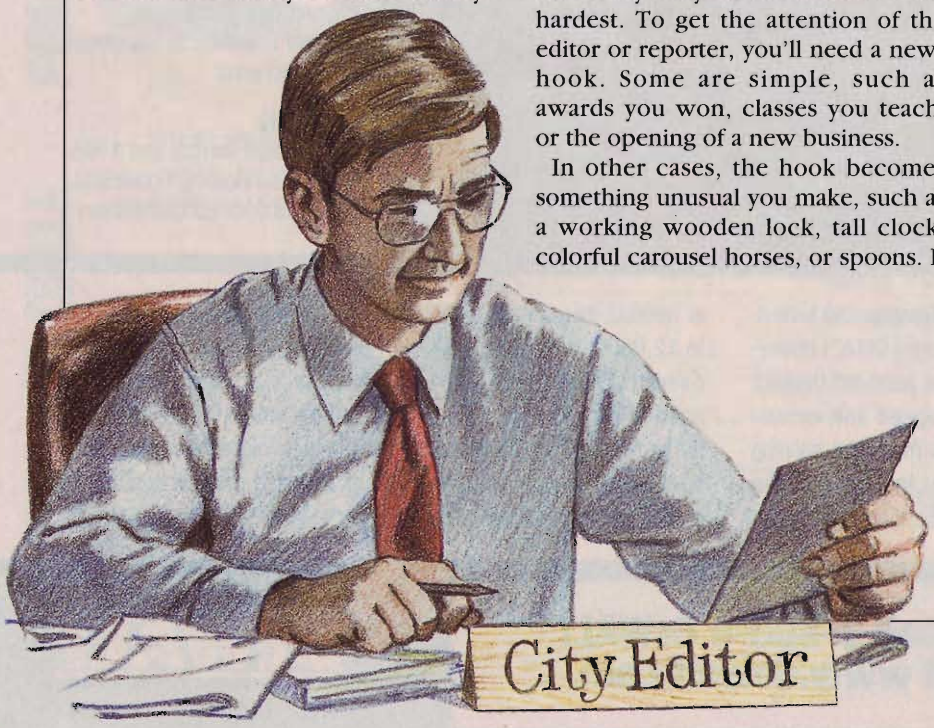
Linking your work with a trend also generates interest. If you sell your woodworking as a post-retirement career, you might bill that as part of a lifestyle trend. Or, if you make fancy birdhouses and know of several customers using them to decorate their gardens, pitch birdhouses as a trend story for a newspaper's garden section. This angle presents a seasonal hook, too.

Get to know the media

For an effective press release, do your homework and familiarize yourself with the publication or station to which you're sending it. Know what kind of stories they run and who writes them. Direct your release to those people and relate your story to something else they may have written. Be aware, though, that if a publication has just done a story on a woodworker, it's unlikely to want another for a while.

Don't boast or exaggerate in your release. But don't be afraid to honestly tell your story, either. Editors and news directors always are looking for news and feature items, and you're actually doing them a service.

You may not get coverage the first time around, but chances are, you eventually will. (Especially if you follow up with a phone call to check that your release was received.) And you'll get far more public attention than any ad you could afford to buy.



Written by Jack Neff, a Batavia, Ohio, business writer and author of *Make Your Woodworking Pay For Itself.*
Illustrations: Jim Stevenson

HOT OFF THE INTERNET

WOODWORKERS TO THE RESCUE

Comments, answers, and ideas from our *WOOD ONLINE®* discussion groups

Note: if you would like more information on the woodworking-related subjects featured here, visit our *WOOD ONLINE®* discussion groups at www.woodmagazine.com.

We haved editied all entries in the interest of brevity and clarity while preserving the message. In addition, we have included more specific information to some messages in brackets, and/or have provided a complete response to some questions.

Looking for the wheel deal

Does anyone know where I might find plans for a wood waterwheel?

—Terre Hooks, Fort Payne, Ala.

● Meisel Hardware Specialties at http://www.meiselwoodhobby.com/woodhobby has three plans for waterwheels. Two are grist flour mill plans. The smaller of these, no.W1853, measures 35"-tall and features an 18"-diameter wheel. It's priced at $8.99. The larger grist mill, no.W2183, measures 50" tall and has a 30" diameter wheel. It's priced at $14.99.

A third plan model is for a basic waterwheel [no.W1852] that measures 48" tall and costs $9.99. I used the big basic waterwheel and it came out great. Call Meisel Hardware Specialties at 800/441-9870; outside the U.S., call 612/471-8550.

—Clarence Bryant, Streator, Ill.

Roll call for rolltop desks

Where can I get a really good plan for a rolltop desk? Also, is tambour very hard to make?

—John S. Johnson, Crossville, Tenn.

● Rockler has a rolltop desk plan and a couple of others are advertised in the back of most woodworking magazines. I have the Rockler plan no. 19126, $29.99, and it is very detailed with four or five large plan sheets. However, I haven't started my desk yet. Call 800/403-9736.

—Tom Hoffman, Cedar Falls, Iowa

● We ran a six-page tambour technique article along with a modified oak rolltop desk in the December 1989 issue of *WOOD®* magazine. To order the back issue, call 800/572-9350. We charge $6.95 per issue.

—WOOD *magazine*

Continued on page 22

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HOT OFF THE INTERNET

Continued from page 20

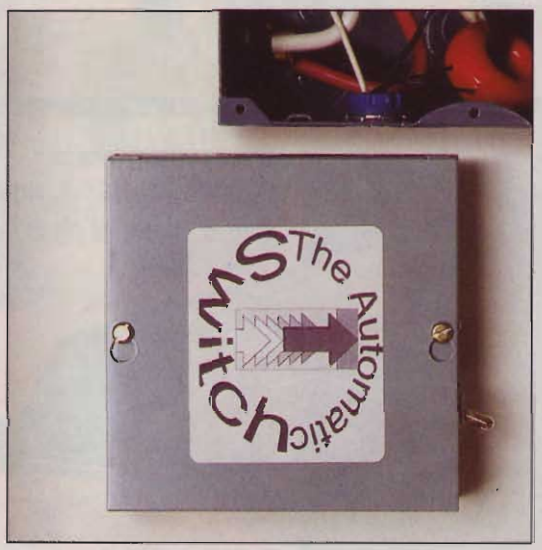
Can't put my finger on remote switch details

Somewhere in the past few months I've seen an electrical device that automatically turns on your dust collector when you start your tablesaw. Does anyone know about this device?

—Keith Lanham, Hartford City, Ind.

● Penn State Industries has such a gizmo, something they call a Long Ranger II. It's a hand-held remote switch that lets you turn on your dust collector from anyplace in your shop. [This includes the LR110 (110 volts system) priced at $59.95, and the LR220 (220 volts system), priced at $69.95. Call Penn State Industries at 800/377-7297.]

—Paul Jones, Louisville, Ky.



● Keith, we have a product review coming up in the magazine on a Crafstman Automatic Power Switch, model 24031. This device plugs into a wall outlet and lets you plug one tool and two accessories into it at one time. For instance, you can plug a bandsaw into the outlet marked "tool," and a light and shop vacuum into the outlets marked "accessory." Then, when you turn the bandsaw on or off, the accessories switch goes on or off as well. Look for the item at your local Sears store.

Also, we reviewed a slightly different product on page 110 of the March 1999 issue, # 113 of *WOOD* magazine. The Automatic Switch shown at *left* from Dan Trimble and Company consists of a sensor ring through which shop outlet circuit wiring passes inside a junction box. When, for instance, a tablesaw plugged into the circuit is switched on, the ring senses the current and turns on selected accessories hard-wired in the wall-mounted switch box. Call 724/357-8555 for more information on this product. It costs $249 and may require that you hire an electrician to install it.

—WOOD *magazine*

When you buy a machine you also buy the company selling the machine. Torben Helshoj, President of Laguna Tools understands the American Woodworker, because he is one. Torben knows firsthand the hard work that goes into every piece of furniture. Having the best tools makes a difference.

TAKE FOR EXAMPLE the Robland X31 combination machine, the #1 selling machine of its kind in the world! Powered by three separate 3HP German motors, the Robland X31 gives you a 10" table saw, 50" of cross cut capacity, a 38" rip capacity, 12" jointer, 12" x 9" thickness planer, reversible shaper and a horizontal mortiser.

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Circle No. 615

TOOL-INDUSTRY INSIDER

Jet Purchases Powermatic

No major changes expected in the near future

If you own one or more pieces of Powermatic equipment, or were considering a purchase of its machinery, you may have been concerned by rumors circulating this past summer about the company's precarious financial condition. Although the Powermatic division has long been profitable, its parent company, DeVlieg-Bullard, had filed for Chapter 11 bankruptcy in July 1999. Well, as far as we can tell, you can now rest easy because Powermatic is up and running at full steam after its recent purchase by Jet Equipment & Tools.

Jet, an importer of woodworking, metalworking, and material handling equipment based in Auburn, Washington, purchased the assets of Powermatic at auction in late September. Powermatic has manufactured a well-respected line of heavy-duty woodworking and metalworking equipment in McMinnville, Tennessee, since 1921.

Jet, which is a subsidiary of Walter Meier Holdings of Zurich, Switzerland, has been on a buying spree lately. In January 1999 it acquired Performax, a drum-sander manufacturer based in Shakopee, Minnesota.

As they have done with Performax, Jet officials expect to maintain Powermatic as its own corporation, but one affiliated with Jet. Current Powermatic management will remain in place and be responsible for all decisions in such areas as manufacturing, purchasing, and marketing. As Bob Skummer, president of Jet told us, "Our first objective is to revitalize Powermatic by infusing the financial wherewithal that will help it regain its premier position in the market. We'll provide the funds necessary to build up production and to make improvements in areas such as product development and marketing."

Skummer assured us that the Powermatic factory and foundry will continue to operate, and that Powermatic's imported line of Artisan equipment will be maintained. He said that product support, such as providing replacement parts, will be stressed.

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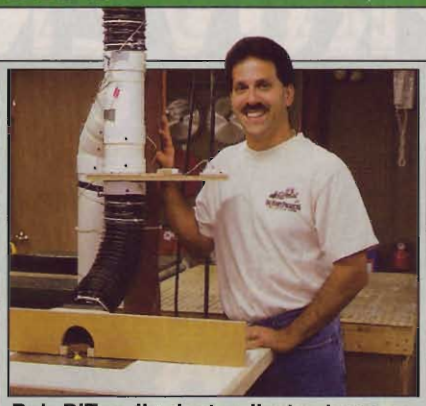

Bob DiTucci's dust collector turns on automatically when he opens a blast gate, thanks to his Top Shop Tip.

The seed was planted 25 or so years ago when Bob DiTucci was a Webelo scout: At the weekly troop meetings, he and the other scouts would make projects in the woodshop of den-leader Mr. Massaro, who had set up a small workbench for each of them. Ten years later, Bob says, "I started buying inexpensive tools and building the small projects I found in *WOOD*® magazine."

Since that time, the woodworker has greatly improved both the quality of his tools and the size of his projects, having recently built from scratch a set of kitchen cabinets for his home. Meanwhile, out in the shop, his new dust-collection system inspired the Top Shop Tip *at right*. Mr. Massaro would be proud.

If you take pride in the way you work, would you take money for it? We pay $75 for each tip we publish. And in each issue, one is chosen as our Top Shop Tip, earning its creator a tool prize worth at least $250. Send us your idea, along with a photo or sketch and your name, address, and daytime telephone number, to:

Tips From Your Shop (and Ours)
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We only use original shop tips, so please send your ideas only to *WOOD* magazine. Sorry, but we can't return submissions. Thanks!

Dave Campbell
GENERAL-INTEREST EDITOR

Magnetic switches make an attractive addition to blast gates

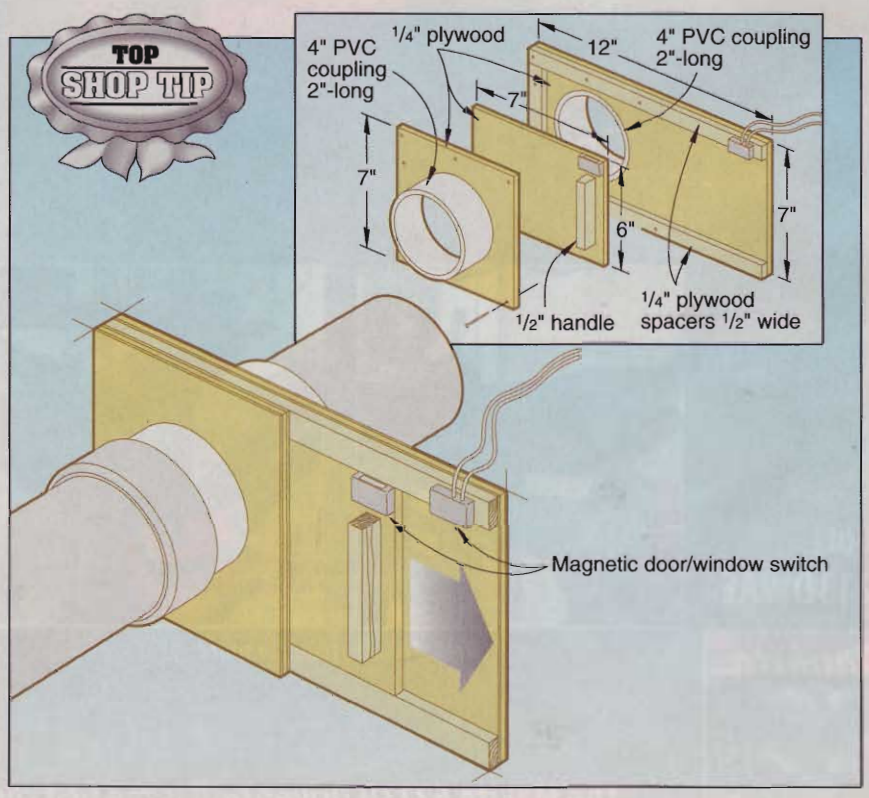
I recently purchased a central dust-collection system for my shop, and liked your idea of using remote low-voltage switches (from the June 1991 issue of *WOOD* magazine) to turn the collector on and off. I wired the system as shown in the article, but instead of a tiny toggle switch at each blast gate, I used a magnetic door/window switch (the kind used in home security systems) at each blast gate, as shown *below*. The switches, which are closed when the magnet is engaged, cost about $5 each at an electronics chain store.

The beauty of this setup is twofold. First, the collector turns on automatically whenever I open a blast gate. And I can't forget and leave a gate open because the dust collector doesn't shut off until all the blast gates are closed.

—Bob DiTucci, Wayne, N.J.

(Editor's note: For a copy of the central dust collection article and the wiring diagram Bob refers to, send $5 to WOOD *Reprints, 1716 Locust St., GA-310, Des Moines, IA 50309-3023. Ask for "Dust Collection #43.")*

Top Shop Tip winner Bob DiTucci adds a Ridgid Oscillating Edge Belt-Spindle Sander and shop vacuum to his tool collection. Nice going, Bob!



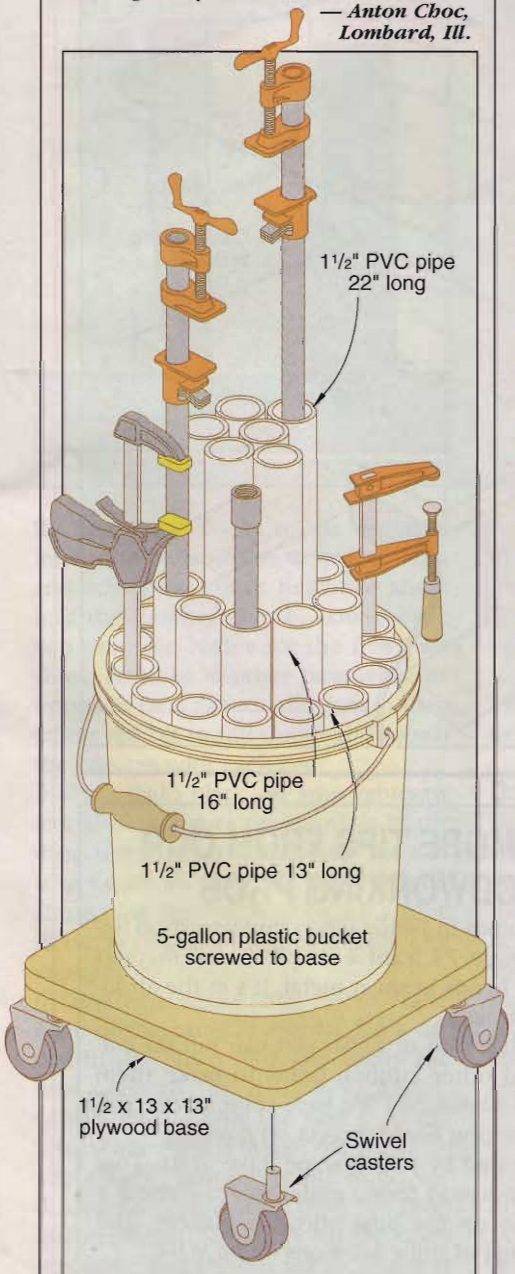
Continued on page 29

Continued from page 26

Bucket of PVC pipe keeps clamps standing handy

Because my shop has limited wall space for clamp storage, I made a rolling rack to keep my clamps within reach wherever I work. I mounted swivel casters to a plywood base and attached a 5-gallon bucket to the base. Then, I filled the bucket with various lengths of 1½" PVC pipe—the longest pieces in the center, the shortest around the outside. My pipe clamps and bar clamps slide right into the PVC, standing ready for their next task.

— Anton Choc, Lombard, Ill.


1½" PVC pipe 22" long
1½" PVC pipe 16" long
1½" PVC pipe 13" long
5-gallon plastic bucket screwed to base
1½ x 13 x 13" plywood base
Swivel casters

Continued on page 30

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TIPS FROM YOUR SHOP (AND OURS)

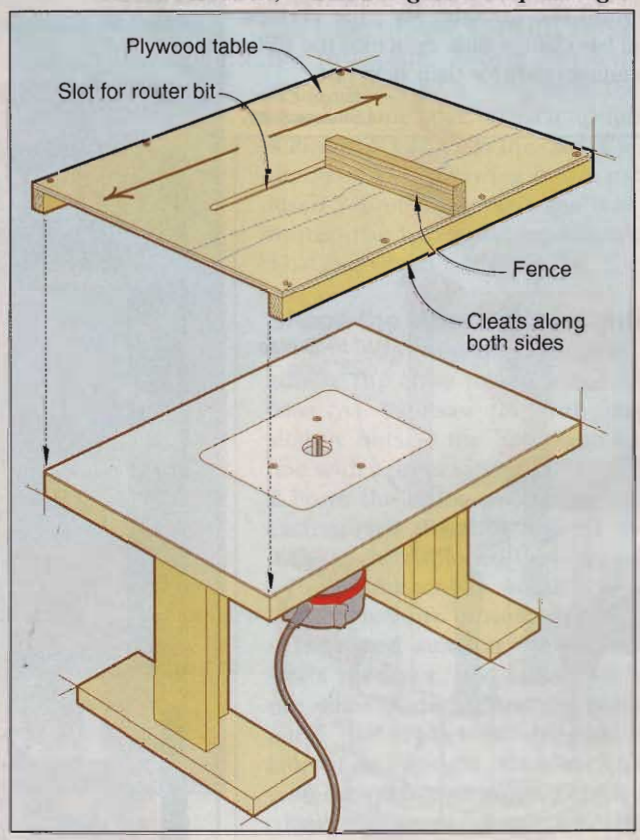
Continued from page 28

No miter slot in your router table? Try an auxiliary tabletop

Sometimes you need to rout across the end of a narrow workpiece. If you have a miter slot in your router table, you'd simply use a miter gauge. But what if you don't have a slot? You could index off the router table itself.

Build an auxiliary tabletop to straddle the router table and attach a fence to it as shown *below*. To rout across the end of a piece of stock, slide the table to the right, put the stock against the fence, and slide both the auxiliary top and the stock across the router bit.

—Chuck Hedlund, WOOD® magazine shop manager



A FEW MORE TIPS FROM OUR WOODWORKING PROS

•Sheet metal comes in handy when building shop fixtures, and on *page 73* learn a simple 3-step method for making tidy bends in sheet metal. It's in the air filtration system project.

•Wondering what kind of finish you can put on cutting boards and other kitchen items to make them both food-safe and durable? We have some advice you can use in the cutting board project on *page 49*.

•If you're frustrated by planer snipe, take heart. Tool tester Dave Henderson found end-of-board dishing a problem with even the best portable planers, and offers a smattering of snipe solutions on *page 94*.

Double-beveling is just the icing on this mitersaw's cake

Until recently, the ability to cut left- and right-bevels was limited to more-expensive sliding compound mitersaws. So when the folks at Hitachi said that their C10FCD nonsliding mitersaw could cut up to 45° bevels on either side, I knew I had to get my hands on one. Now that I have, I'm impressed. But the dual-beveling capacity is only one of many things I like about this saw.

For instance, just as on their 12" sliding compound-miter saw, Hitachi engineers placed the C10FCD's motor above and behind the belt-driven blade. Besides providing the necessary clearance to make 45°-right bevels possible, the move also resulted in a quiet, well-balanced machine; I didn't have to wrestle against a stiff spring to lower the blade into my workpiece.

I also like the innovative miter scale; instead of moving the cursor over a fixed scale, the C10FCD moves the scale under a fixed cursor which makes setting accurate angles easier. And, because the cursor is well to the right of the blade instead of directly beneath it, you avoid the constant head-jockeying to see the miter angle that other saws require.

The C10FCD features a generous 13-amp. soft-start motor that didn't try to torque the handle out of my hand when I pulled the trigger. Electronic speed control senses when the tool is under load and automatically compensates by pumping more power to the motor to maintain blade speed.

Although I can count on one hand the number of times I've needed to cut a right-bevel compound-miter, this saw does make the process much more intuitive than a regular mitersaw. But right-bevel capacity or not, you'll be pleased with the performance—and price—of this lightweight, feature-packed mitersaw.

—Tested by Dave Henderson

PRODUCT SCORECARD

Hitachi C10FCD compound mitersaw

Performance	★ ★ ★ ★ ★
Price	$265
Value	★ ★ ★ ★ ★

For the location of a Hitachi dealer near you, call 800/546-1666.

Continued on page 34

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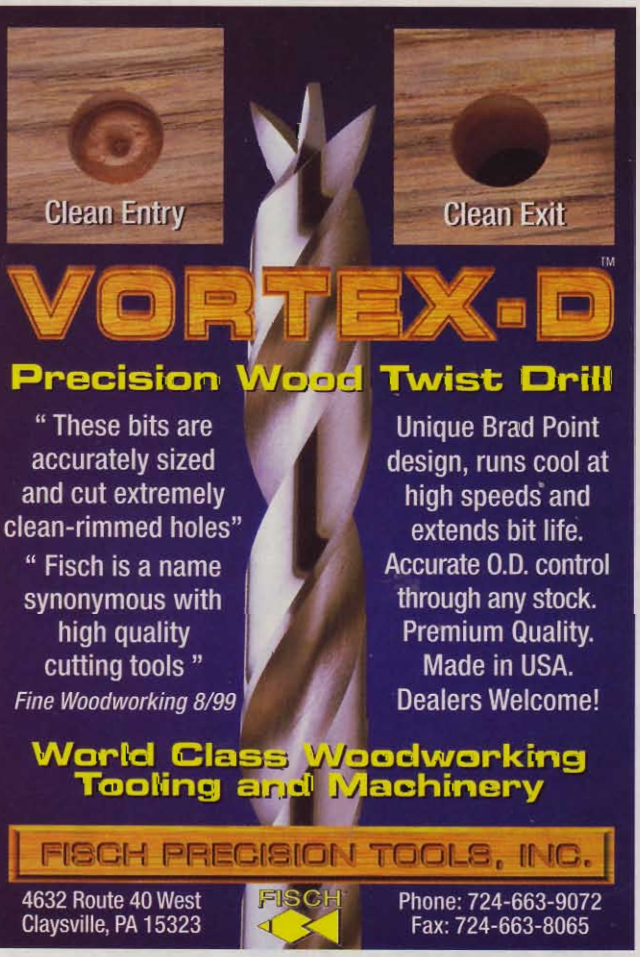

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PRODUCTS THAT PERFORM SHOP TESTED

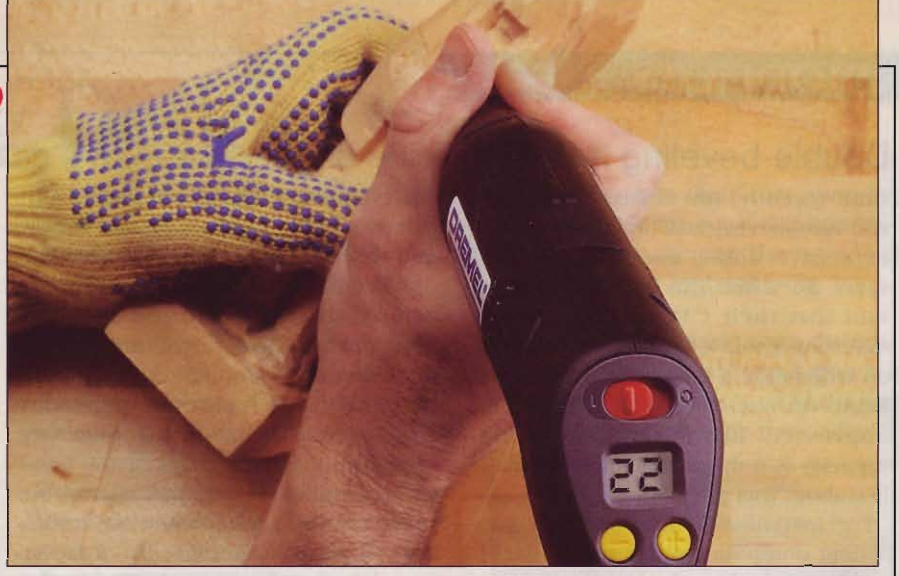
Continued from page 33

Dremel goes digital for its turn-of-the-century rotary tool

Dremel has been making high-speed rotary tools for so long, its name has become practically synonymous with the category. The company's latest entry into the field—the Professional model—builds on that reputation in fine fashion.

Unlike other variable-speed tools, the Professional shows the rotational speed on a large liquid-crystal display. Each push of a speed-control button raises or lowers the speed by 1,000 revolutions per minute, from 5,000 to 30,000 rpm, giving you precise adjustments for just about any task.

I like the tool's "soft start" feature, which brings the tool up to speed gradually instead of practically yanking it out of your hand on a high-speed start. And electronic feedback control senses when the tool is under load and compensates by automatically adjusting the speed.



The Professional has a couple of life-lengthening features it would be easy to overlook, such as user-replaceable motor brushes that don't demand dissection of the tool, and a cooling fan that exhausts out the front and keeps debris out of the motor. The model we tested came with a plastic storage case and 25 accessories; model 3983 sports 40 accessories and a larger case and sells for $119.

—Tested by Dave Henderson

PRODUCT SCORECARD

Dremel Professional High Speed Rotary Tool Kit 3981

Performance	★ ★ ★ ★ ★
Price	$99
Value	★ ★ ★ ★ ★

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QUAIL COUNTRY

You can go there with your scrollsaw

Bring country charm indoors with this quaint quail cutout. With window light streaming from behind, this lovely scene takes on nature's glow.

First, scrollsaw the quail picture

1 Photocopy the full-size quail pattern in the *WOOD PATTERNS*® insert. Stick the pattern to a ¼×6⅜×8⅞" piece of Baltic birch plywood using spray adhesive.

2 Drill blade start holes inside the larger cutout areas and near one end of each stopped detail line. For joined detail lines, such as the birds's wings, drill one hole for entry into the entire series of lines.

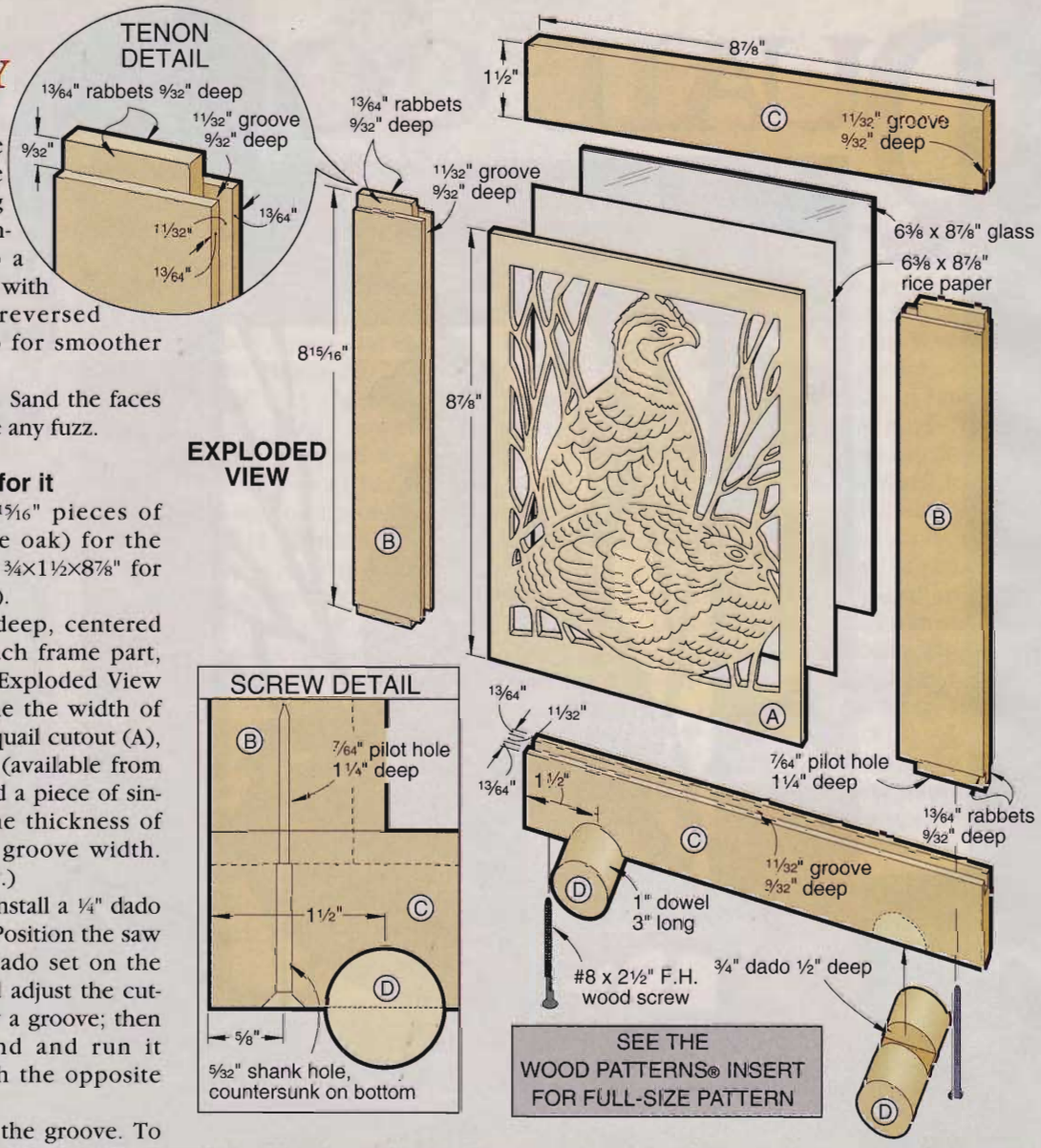
Scrollsaw master Rick Hutcheson, who cut out our quail picture, drilled starting holes for the detail lines with a #58 twist drill. (See the Buying Guide for a source.) A larger hole, say 1/16", works fine for the cutout areas.

3 Saw the detail lines first, using a thick blade so they'll show up with backlighting. To cut a wide kerf and still be able to make the sharp turns, project designer Steve Grimes recommends cutting these lines with a #0 spiral blade (.011×.028" with 41 teeth per inch).

To saw the lines, thread the blade through the start hole for the first line. (Start wherever you want.) "You'll probably have to hammer the blade ends flat to fit your saw's clamps," Rick counsels. "And remember," he adds, "these blades have a top and bottom just like regular ones. The teeth must point down when you install the blade."

Unlike ordinary scrollsaw blades, spiral blades cut in any direction. "Spiral blades are hard to control; just try to stay on the line as much as possible," Rick advises. "If you do stray off a line, steer back to it gradually; don't jog back suddenly."

Continued



4 After sawing the detail lines, cut out the openings, including the eyes. Rick recommends switching to a #2R blade (.014×.032" with 20 teeth per inch, reversed teeth at the bottom) for smoother cuts here.

5 Remove the pattern. Sand the faces as necessary to remove any fuzz.

Now, build a frame for it

1 Cut two ¾×1½×8 15/16" pieces of hardwood (we chose oak) for the sides (B). Cut two to ¾×1½×8⅞" for the top and bottom (C).

2 Saw a groove 9/32" deep, centered along one edge of each frame part, where shown in the Exploded View drawing. To determine the width of the groove, stack the quail cutout (A), a piece of rice paper (available from art-supply dealers), and a piece of single-strength glass. The thickness of the stack equals the groove width. (Ours came out to 11/32".)

To saw the groove, install a ¼" dado set on your tablesaw. Position the saw fence to center the dado set on the edge of the stock, and adjust the cutting depth to 9/32". Saw a groove; then turn the part around and run it through the saw with the opposite face against the fence.

Check the width of the groove. To widen it, tap the tablesaw fence toward the blade. Pass the part twice through the saw again, and measure the groove. Continue adjusting until you hit the needed width. Then groove the rest of the frame parts.

3 Saw tenons on both ends of the sides (B). To do this, adjust the dado set's cutting depth to the same dimension as the thickness of the sides of the groove in part C, as shown in the Tenon detail. Install an auxiliary fence on your miter gauge, and position a stopblock to set the tenon length to the depth of the mating grooves in parts C, as shown.

4 Assemble and glue two sides (B) and the top of the frame (C). Clamp the bottom (C) in position to help square up the frame, but do not glue it.

5 Drill 7/64" pilot holes through the bottom (C) into the lower end of each side (B) where shown. Remove the bottom, marking the parts for reassembly. Enlarge the holes through the bottom to 5/32", and countersink them on the bottom edge.

6 Make the feet (D), starting with a 12" length of 1" dowel rod. Clamp a V-block to your tablesaw's miter gauge, and clamp the dowel to the V-block. Then, with a ¾" dado blade, saw a ½"-deep dado 1⅛" from the end. Turn the dowel around, and saw a dado 1⅛" from the other end. Cut a 3" length off each end for the feet.

7 Sand the feet. Glue and clamp them to the bottom (C) where shown.

Finish the picture and frame

1 Finish-sand the quail cutout and frame. Blow or vacuum the sawdust out of the scrollsawn detail lines. Stain and finish as preferred. (We stained the frame and cutout with Minwax no. 230 Early American stain, and sprayed on two coats of Minwax satin-finish fast-drying polyurethane.)

2 Clean the glass; then stack it, the rice paper, and the quail cutout together as shown in the Exploded View drawing. Slide the stack into the frame, and attach the bottom with screws. Display the cutout where it will be lighted from behind.

BUYING GUIDE

Small twist drill, blades. Twist drill, #58, $7.50/dozen; #0 spiral blade, $2.25/dozen; #2R blade, $2.35/dozen. Small orders ship via priority mail, about $3.25. Sloan's Woodshop, call toll-free 888/615-9663 to order.

Project Design: Steve Grimes; Jan Hale Svec
Illustrations: Roxanne LeMoine; Lorna Johnson
Photograph: Hetherington Photography

Backyard Bowyer

Kent Ostrem saws his bows outdoors, but his work earns him a place in traditional archery's inner circle

This Mahaska longbow has a honey-locust riser. The arrow quiver is made from the skin of a javelina shot in Texas.

Iowa boyer Kent Ostrem knows all about Robin Hood. But he'd rather talk about men such as Fred Bear, Howard Hill, Ben Pearson, and other renowned archers of the 1950s and 1960s. They were "traditional" bowmen who used fiberglass-backed longbows and recurves to hunt game world-wide. Their exploits were celebrated and greatly contributed to archery's growth into a popular pastime.

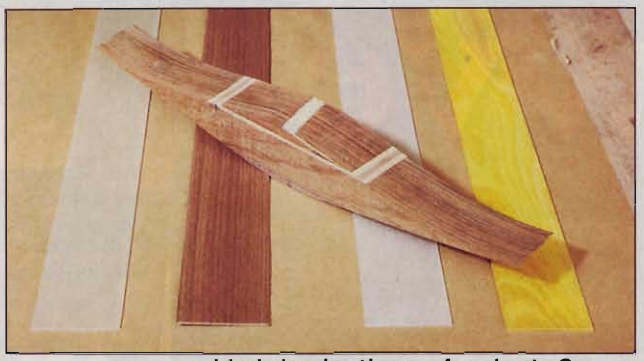
"Today, you'll find three types of archery: primitive, using all-wood self-bows like the American Indians did; traditional, with glass-backed, laminated-wood longbows and recurves; and mechanical, with compound bows," explains the 42-year-old bow maker. "Myself, I was a traditional archer before there was a name for it. I started bow hunting in 1968 with a Bear recurve that my dad bought me. In 1973 I finally shot a deer, and did it pretty consistently after that. About 1976, compound bows became popular. The first one I saw was in *Mechanics Illustrated*, which was where it belonged with all its pullies and other components! I thought that was the most ridiculous thing I ever saw. It could never catch on."

Young Kent made a wrong call back then. Compound bows became the rage, mainly because their system of pullies enables an archer to draw the bow with some 60 percent less effort than a traditional bow. But with some,

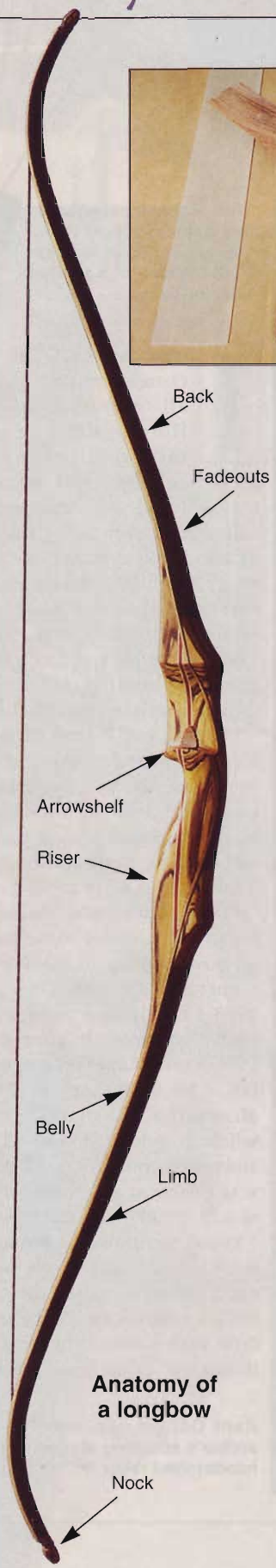
Kent Ostrem assumes the traditional archer's shooting stance with one of his handcrafted recurves.

Continued

Backyard Bowyer



Limb laminations of walnut, Osage orange, and fiberglass sit atop the workbench with a riser blank.



Anatomy of a longbow

a romance with longbows and recurves lingered. "Today, there's an anti-high-tech attitude. People want to get back to the basics," Kent observes. "Yet, many don't want to get quite as basic as primitive archery. That's where I come in. I fill the niche with custom-made, traditional bows."

The birth of a bowyer

Kent's one-man bow-making business thrives from his Oskaloosa, Iowa, home. His fiberglass-backed longbows and recurves find their way around the world. But it took a lot of new skills and bad bows to reach the high level of customer satisfaction his Mahaska Custom Bows have attained. (Mashaska is the name of an Ioway Indian chief of the mid-1800s.)

"I started making traditional bows in the late eighties as a hobby," says Kent as he examines the wood-and-fiberglass laminations for a new bow. "A friend and I ordered bow kits. But as I read the instructions, the methods seemed like they weren't effective. So I began doing some reading and built it following my intuition. After that first one, I got so hooked that my friends started calling me the 'Bow of the Month Club.' I spent all my spare time making bows to sell.

"Finally, in 1992, I thought I had enough business to do it fulltime," he continues. "Luckily, my decision tied in with the resurgence in traditional archery. It's still a relatively small market, but there's enough to make a living. And I'm not building real elaborate bows. I make quality custom bows and keep the price reasonable. My most expensive bow would be the premier recurve at $420. My longbows are relatively basic, but good looking, and cost around $300. Yet, if somebody wanted a $600 to $700 bow, I'll build it!"

The first three years, Kent was traveling to traditional archery meets all across the nation to show his bows and take orders. "Now that I'm fairly well established, I depend on word of mouth, advertisements in archery magazines, and just a couple of traditional shoots [meets] a year," he says, almost sighing in relief. "I've also developed pockets of customers around the country—I sell a bow to one archer and others see it and order theirs. And I operate another business arranging and guiding bow hunts that keeps me busy in the spring and fall."

The woods behind the 'glass

Kent made his first bow from a kit because the bowyer he called for a custom bow didn't work in the woods he wanted. Due to that experience, he now offers his bows in a wide range of woods for risers and limb-core laminations (see Anatomy of a longbow drawing, *left,* and "The bowyer's top woods," on *page 45*)

"For limb cores, I primarily use red elm—it's the most popular—Osage orange, cherry, walnut, and, as an accent lamination, sugar maple," Kent comments. "There are so many native woods that I could use because it's a matter of fact, you could probably make a 'glass-backed bow out of a pine block. You see, unlike a self-bow made from one piece of wood, in a laminated bow it's the fiberglass backing that's doing the work. The wood in the core people pick for its appearance. For instance, there's hackberry—real pretty stuff. I'd use that for a bow up to around 50-pounds pull. And even catalpa, though it's weak, doesn't easily split and looks great. But I'd only recommend it for a low-poundage kid's bow."

For bow handles, called risers among bowyers, he needs strong wood because that section bears the brunt

of the pull when the bow is drawn. And he frequently turns to exotics, such as shedua, zebrawood, and bubinga. "There are a lot of people in traditional archery who really know their woods, and when they call to order a bow, they want something specific," notes Kent.

Tips on laying up a bow

Building a bow requires precise alignment for complete adhesion of its fiberglass and wood laminations, plus the riser. Otherwise—at the least—the bow won't shoot straight. At the very worst, it could break when strung and drawn.

"Most of my longbows are 'three-lam,' that is, two laminations of the same limb-core wood with an accent lamination sandwiched between," explains Kent. "Then, there's a one-piece fiberglass lamination over the wood on the back and a two-piece one on the belly above and below the riser." Extra-long longbows get four laminations and recurve bows two.

Kent buys and uses sanded and tapered wood laminations that are thicker at the butt end near the handle and taper at a rate of .002" per inch to the tip. So, a lamination of red elm might be nearly ⅛" thick at the butt and paper thin at the tip. The fiberglass doesn't taper.

Taper in the limbs gives a bow a bullwhip effect that snaps taut the bowstring with great efficiency. Some bowyers like taper; others don't. And some combine parallel (untapered) and tapered laminations.

To lay up and glue the laminations requires a reusable jig called a bow form. Most bowyers make two-piece forms that clamp together—one for each side of the bow with the void between in the desired bow shape. Kent, however, prefers a one-piece form on which he lays the epoxied laminations, then clamps them snugly in place. "My laminations are always 2" wide, so if they slide a bit under pressure I'll still have a bow blank after I trim them off to 1" or so," says Kent. "Many bowyers use narrower laminations that don't have leeway for error. But if they slip, they've wasted a bow."

Kent tries for even pressure. "I don't want to crush the bow, just get good glue lines." After all the clamps are in place—a C-clamp about every 2" from tip to tip with protectors on the pads—the glue-up goes into the heatbox. That's an insulated, bench-high unit built of plywood and wired with six 100-watt incandescent bulbs on a timer as a heat source, as shown in the photo *below*.

"I could leave the clamp-up to dry on the bench. But I'm going to cook it at 170° for six or seven hours," he says. "That way, it can withstand being locked up in a car on a hot summer day without delaminating."

Getting a bow to weight

A bow's draw weight, or pull, means the number of pounds of energy (usually 30–65) required to bring it to full draw with a 28" arrow. The higher the draw weight, the more muscle it takes to pull and hold the arrow on target. Seems simple enough, but getting there from a laminated blank is really the hardest part of building a bow, according to Kent.

Of course, it's not a guessing game. After a decade of bow making, Kent has accumulated fastidious notes describing what went into each custom bow that came from his shop. That way, when someone orders one similar to any he's made, he has reference to materials, type of laminations, etc. to use again.

"What determines a bow's draw weight is the thickness of the fiberglass and the wooden limb cores," he points out. "I state my bows to be plus or minus two pounds from

Continued

At his workbench, Kent cleans laminations with denatured alcohol before gluing them up. In the heatbox below, a glued-up bow clamped to its form awaits removal.

Backyard Bowyer

ordered weight. And that's pretty much understood in this business—it's not rocket science. Still, I'm not going to sell something that someone's not going to be happy with. That's why when I build a new bow design, it takes me a dozen or so of them to get it down to draw weight in the various lengths [longbows from 62-68", recurves from 52-62"]."

Kent continues the work of getting a bow to weight after it comes out of the heatbox and he unclamps it. He runs a strip of masking tape down the bow's back, then clamps a mason's string from tip to tip, centering it over the riser. "Centering the string has a major bearing on how the bow will eventually shoot. The string has to track straight in relation to the riser," he says. "Just a teeny bit off and you'd never get the bow tuned properly for good arrow flight".

Once the bowyer has marked the center line, he uses a specific template for that weight of bow and a pencil to lay out the bow's shape on the blank. Then, he moves outside where he'll saw out the blank freehand on his portable benchtop tablesaw. "That fiberglass dust is really too nasty for the shop," he says about the outdoor operation. "Lots of bowyers rough-out with a bandsaw, but the fiberglass eats up those blades. On the other hand, my little carbide tablesaw blade has lasted over seven years."

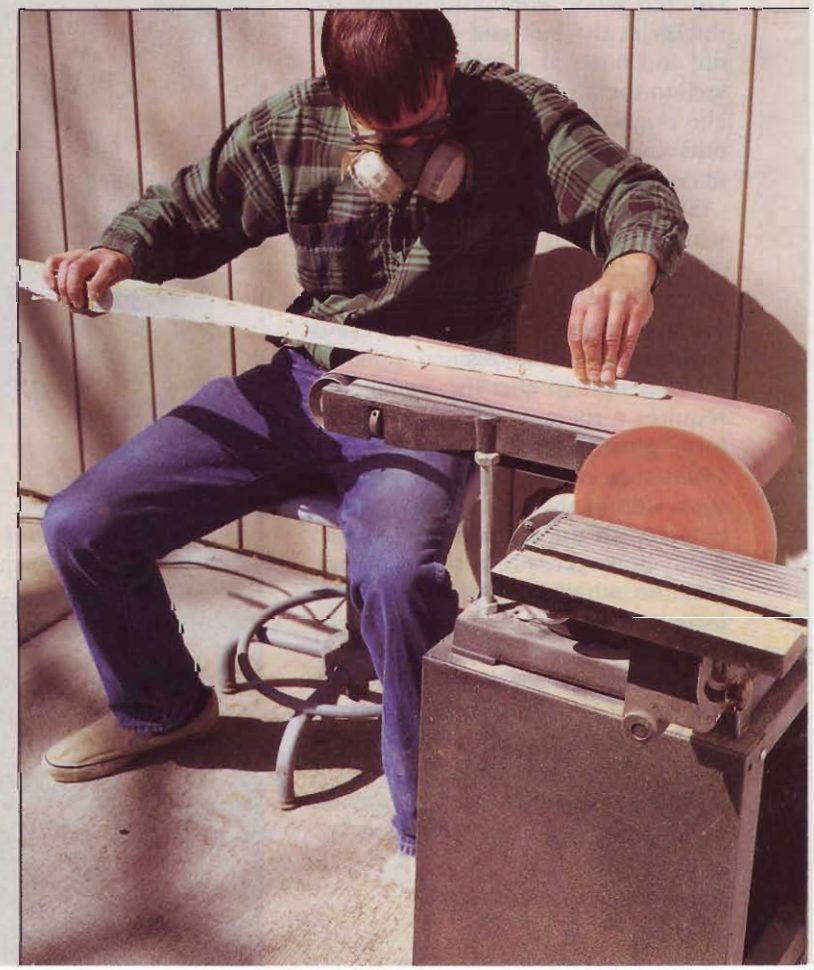
With the bow now sawn to rough outline, Kent hauls out the stationary belt sander and begins to take off more of its limb core and to rough-shape the riser. It's an attentative process as he pauses frequently to string the bow and take measurements between string and limbs just below the fadeouts (where the riser feathers into the limb-core laminations). "To be absolutely true, the bow must bend in the same plane—the string has to run right down the middle of the riser," he notes. "By taking off a little here and a little there, I get it down to draw weight. At the sanding drum on my drill press, I'll further refine the shape of the limbs and the riser."

Following the drum sanding comes a thorough smoothing by hand with 80- through 220-grit abrasives. Should he find any detracting checks or open grain in the riser, he'll rub in a little Super Glue, then sand the spot smooth. To finish, Kent sprays on eight coats of Defthane (a polyurethane; lacquer would crack) in either gloss or satin. For an archer desiring a flat finish, he knocks down the satin with extra-fine steel wool. Finally, Kent wraps the riser in leather and glues the leather pad on the shelf (arrow rest).

To a novice, the bow-making process might seem tedious and error-prone, and it really is. "The 'glass can splinter if hit the wrong way with the blade or sander and you'll ruin a bow just like that. Making one from scratch is not for a beginner because you can

To avoid filling his shop with fine and smelly fiberglass dust, Kent saws the bow blank to rough shape outside.

Sanding not only smooths the bow; it's necessary in order to shape the limbs to arrive at the desired draw weight.



During sanding, constant measurements between the strung bow's limbs and string tell Kent how close he's coming to the draw weight.

At his drill press, the bowyer further refines the shape of the bow's risers and limbs with a drum sander.

invest $50 in materials and with one stroke turn it into junk," Kent comments. Then, he cautions. "And if not made right, a bow can be dangerous when you go to string it— somebody could get hurt if the limbs break. For a beginner, a kit is the way to go." (See box at *right, top*.)

After many hundreds of bows over the years, though, Kent has the bow-making process down pat. He can complete a bow in about five hours (not including its curing time in the heatbox). "I could build a ton of bows in a week if I wasn't on the phone half the time," Kent says, feigning exasperation. "Potential customers call with questions about bows and my hunts. Sometimes I talk to a person for a half an hour making a sale. But that's how it is when you run a one-man business. Over the phone, people will often ask,'Are you the boss man?,' thinking that I've got a manufacturing facility here. I reply 'I am the *only* man.' And that's what archers really want, to talk with the person who is actually going to build their bow."

Written by Peter J. Stephano
Photographs: Marty Baldwin
Drawing: Brian Jensen

Want to see more custom bows, even make your own?

For a color brochure of Mahaska Custom Bows and information on guided bow hunts for javelina, black bear, whitetail deer, and buffalo, write Mahaska Custom Bows, P.O. Box 452, Oskaloosa, IA 52577. Or call 515/673-5501. Sorry, due to time constraints, Kent can't answer personal questions regarding bow making or materials. He suggests contacting the following resource for videos, bow kits, and materials: Traditional Bowyers Supply, 445 N. Stine Rd., Charlotte, MI 48813. 517/543-8167

A BOWYER'S TOP WOODS

Nothing can stir up a more heated discussion among bowyers than the topic of the best woods to use. Many bowyers favor the following. (Note: Under limb-core woods, the *modulus of elasticity (ME)* indicates how easily it bends or flexes. The higher the number the greater the resistance to bending.)

Limb-core woods

Black locust. Not especially pretty, but available and inexpensive. ME=2.05
Sugar maple. Preferred for limb core accent, widely available. ME=1.83
Black walnut. Dark, good shooting wood, relatively expensive but readily available. ME=1.68
Red elm. Readily available and inexpensive; attractive when flat sawn. ME=1.54
Black cherry. Not as stiff as some choices, but attractive and durable. ME=1.49
Osage orange. A favorite for self-bows, fine-grained, orange color darkens with age. No stated ME, but approximates black cherry.

Riser (handle) woods

Straight grain, strength, and attractiveness are desired for this part of a bow.
Native hardwoods: ash, black walnut, butternut, elm, hackberry, locust, Osage orange, and red gum.
Exotic hardwoods: bocote, blackbean, bubinga, cardinal wood, cocobolo, ebony, granadillio, koa, paduak, purpleheart, rosewood, shedua, tulipwood, and zebrawood to name the most popular.

Going Overboard

Quilt Block Serving Board
Instructions at *right*

Quilt Block For

Start work in the middle

1 Photocopy the Full-Size Star Pattern in the *WOOD PATTERNS®* insert in the middle of the magazine. Carefully separate the pattern segments, keeping all of the pattern lines intact.

2 Using spray adhesive, adhere the patterns for parts A and C to 1"-thick Honduras mahogany stock. Stick the patterns for parts B and D onto 1" walnut stock. Align the arrows with the wood grain.

3 Bandsaw parts A, B, C, and D, staying slightly outside the lines. Sand the edges marked *1* and *2* to the pattern lines. These will be gluing surfaces, so sand them straight and smooth on a disc sander or wide belt sander, using a 120- or 150-grit disc or belt.

4 Referring to the Quilt-Block Cutting Board drawing in the pattern insert, lay out the parts in A/B and C/D pairs. Ensure that the mating edges between each pair fit well; then glue each pair together. Align the V tails, as shown *opposite page, top left*, and keep the faces flush.

5 Sand each assembly to the outside lines (marked *3* on the patterns). Each A/B assembly should measure 2" from edge to edge, with the edges straight and parallel and the joint centered. Similarly, the C/D assemblies should measure 2" long.

6 Glue these four sections into two assemblies, joining them along the B-C line (marked *4* on the patterns). To do this, sand the mating surfaces to the pattern line as before. Test-fit the parts before gluing to ensure that B and C form a 90° angle, as shown *opposite page, right*.

7 Sand each A/B/C/D assembly to the line marked *5* on the patterns. Holding the two A/B/C/D assemblies together, check the angles between A and D; they should be 90°.

8 Glue the two A/B/C/D assemblies together. Align the points so they meet at the center.

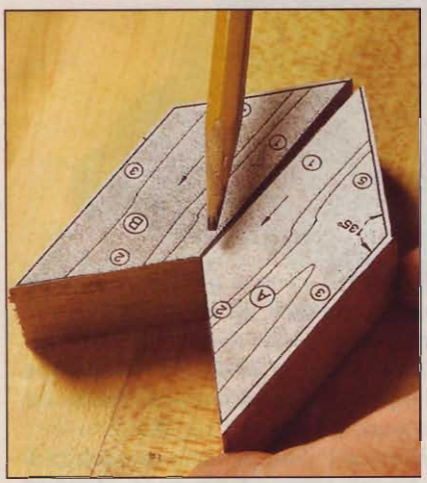
Not just one, but three sharp...

Ladybug Serving Board
See *page 49*

...cutting and serving boards

Domino Cutting Board
See *page 48*

Canapes



Align the V-tails of the star arms as you glue the pieces together; you can adjust the points later, if necessary.

9 Adhere the patterns for parts E to 1"-thick maple stock. Bandsaw them, and sand to the line where they fit into the star. Leave the parts slightly overwidth until they're glued in. Then sand them flush with the C/D tail points. Remove the patterns.

Build a square around the star

1 Cut parts F, G, and H to the thickness and width shown in the Bill of Materials, but make F and G ½" longer and H 1" longer than specified.

2 Clamp, but do not glue, parts F to the A/B/C/D/E assembly (the star). Ensure that the two parts F fully span the distance from A or B to the point on C or D, as applicable.

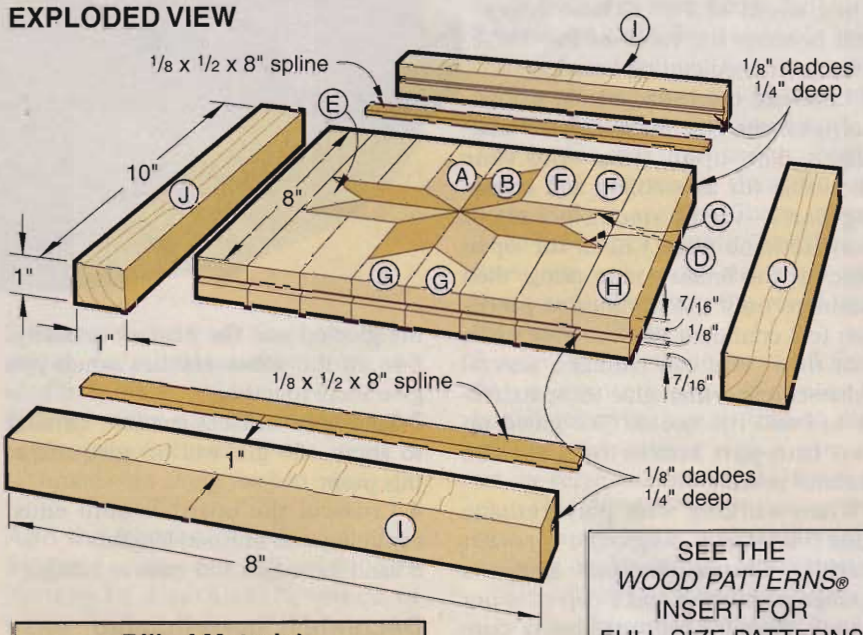
3 Lay out and saw the mitered end of each part G. Slide the pieces into place between parts F, and check their fit at the end against parts A and B. Adjust the end fit by sanding.

4 Glue parts F and G to the star. Keep the surfaces flush by clamping the glueup between platens covered with waxed paper.

5 Glue parts H to the assembly.

6 Measure the width of the board, from the outside edge of one part H to the outside of the other. Trim the board's length to the same dimension, centering the star on the board.

EXPLODED VIEW



SEE THE *WOOD PATTERNS®* INSERT FOR FULL-SIZE PATTERNS

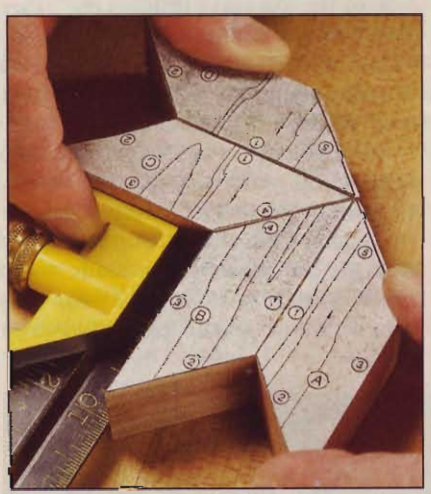
Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A* point	1"	1"	3"	HM	2
B* point	1"	1"	3"	W	2
C* side point	1"	3"	1"	HM	2
D* side point	1"	3"	1"	W	2
E* side filler	1"	1"	2"	M	2
F* board middle	1"	1"	3"	M	8
G* end filler	1"	1"	2"	M	4
H* board edge	1"	1"	8"	M	2
I* frame end	1"	8"	1"	W	2
J* frame edge	1"	1"	10"	W	2

*Cut parts oversize initially; then cut to finished size in accordance with how-to instructions.

Materials Key:
HM–honduras mahogany; M–maple; W–walnut

Supplies: polyurethane glue, finish.



Keep the star arms at 90° to each other. Accuracy here ensures success later.

Frame the block with walnut

1 Cut the board ends (I) to the dimensions shown. (Verify the width of I by measuring the lamination's width.)

2 Form a ⅛" dado ¼" deep, centered on each end of the board, where shown in the Exploded View drawing. Cut a mating dado on one end of each part I. (Because of the grain direction on parts I, the ends are long faces.)

3 Cut two ⅛×½×8" splines from hardboard. Glue on the walnut ends (I), inserting the splines in the joints.

4 Verify the overall length of the board; then cut the board edges (J) to size. Glue the edges to the board.

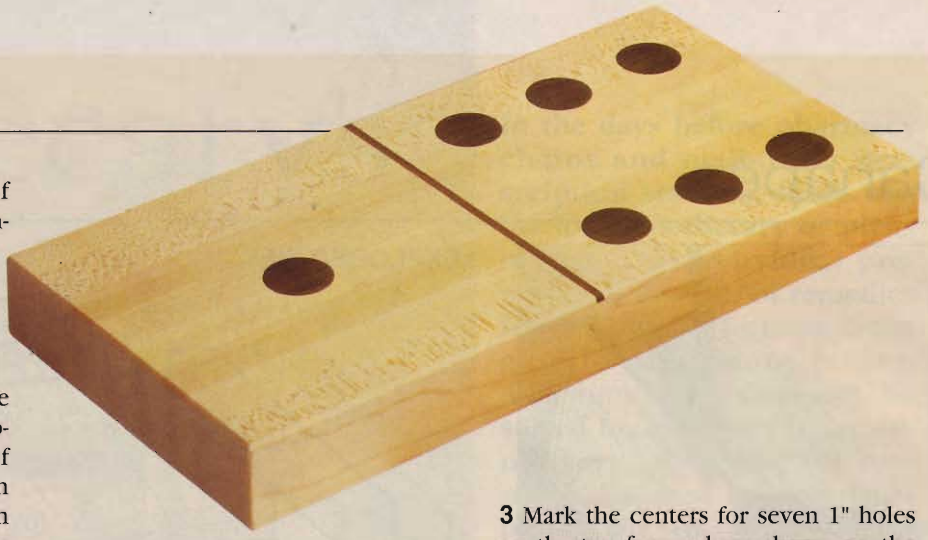
5 Sand the board smooth and flush. Sand a round-over along all edges.

6 Finish, referring to *Tips on finishing your cutting board* on *page 49*.

Continued

Cutting Boards

Oh, Domino



Laminate the basic board

1 Cut eight ¾×1½×13" pieces of maple, and joint both edges to a finished width of 1⅜". (These edges will become the faces of the 1⅜"-thick laminated cutting board.)

2 Laminate the board blank, using polyurethane glue for moisture resistance. The open time—the time allowable for assembling and clamping parts—varies among brands of polyurethane glue. Check the open time for the brand you're using; then laminate only the number of pieces you feel confident you can glue up in that time. You can laminate several subassemblies, then glue those together to build the board. (We glued up two four-part laminations for the domino board.)

When working with polyurethane glue, *WOOD®* magazine project builder Chuck Hedlund keeps a sponge paintbrush and a cup of water handy. Because moisture helps cure the adhesive, he applies glue to one side of the joint and brushes the other part with the dampened brush.

Line up each lamination's faces flush during gluing; this will make the next step easier. To align the faces, sandwich each glue-up between two scrapwood platens, as shown *below*. (Plywood or particleboard pieces a little smaller than the glue-up would be fine for the platens; we made them approximately ¾×2½×12" for this board.) Place waxed paper between the glue-up and the platens. Similarly, line up the subassemblies when you glue them together.

3 Sand both surfaces smooth. Sanding to about 120 grit will be adequate at this point.

4 Crosscut the board at both ends, trimming it to finished length.

5 Sand the edges and ends to 120 grit.

Decorate it like a domino

1 Saw a ⅛"-wide kerf ⅛" deep across the middle of the board on the top face. (An outside blade from a stackable dado set does the job nicely.)

2 Resaw and plane a piece of walnut scrapwood that's about 1" wide and at least 6½" long to a thickness that fits snugly into the board's kerf. Cut a piece of the thin stock to about 3/16" wide, and glue it into the kerf. After the glue dries, plane or sand it flush with the surface, and trim it flush with the edges of the board.

3 Mark the centers for seven 1" holes on the top face, where shown on the full-size pattern in the *WOOD PATTERNS®* insert. (You can photocopy the pattern and adhere it to the board to mark the holes, if you like.)

4 Bore a 1" hole ¼" deep at each center mark, using a Forstner bit chucked in a drill press.

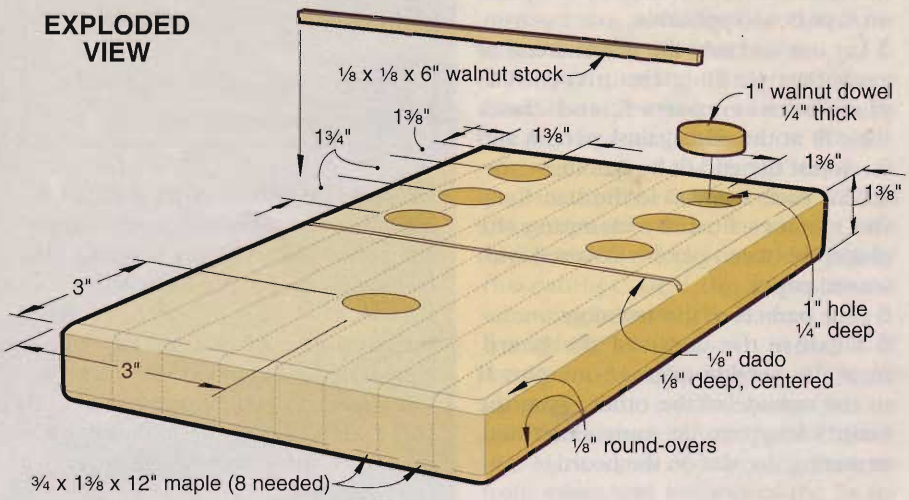
5 Slice seven ¼"-thick discs from a 1" walnut dowel rod. (To do this, we first sanded one end of the dowel rod true, using the miter gauge on the disc sander. Then we clamped the rod to the bandsaw's miter gauge, and cut off the ¼" piece. Next, we took the rod back to the disc sander, sanded the sawn end smooth, and sliced off the next piece, continuing this process to make all seven markers.)

6 Glue the walnut discs into the holes.

7 Sand the top face of the board flush. Then rout a ⅛" round-over all around the edge on both sides.

8 Apply a clear finish, referring to the tips on the *opposite page*.

Sandwich the lamination between scrapwood platens to keep the surfaces flush.



Ladybug, Ladybug

Build up the body first

1 Cut 11 pieces of cardinalwood or another reddish-colored hardwood ¾×1×9¾", and laminate them into a 1×8¼×9¾" blank.

2 Photocopy the Ladybug Body Full-Size Pattern, found in the *WOOD PATTERNS®* insert, and adhere it to the top of the blank. Center the body from side-to-side on the blank.

3 Rout or saw a 1/16" groove ¼" deep where shown. For best results, cut the groove the full length of the blank.

4 Cut a strip of wenge to fit into the groove. Glue it into place.

5 Transfer the centers for the head and tail holes from the pattern to the opposite side of the blank. Bore holes of the diameter and depth indicated, using a Forstner bit.

6 Bore holes where shown for the ladybug's spots. Cut the spots out of ¼"-thick wenge, using plug cutters or a scrollsaw, and glue them in place.

7 Bandsaw the body to shape. Saw slightly outside the pattern line, and sand to it.

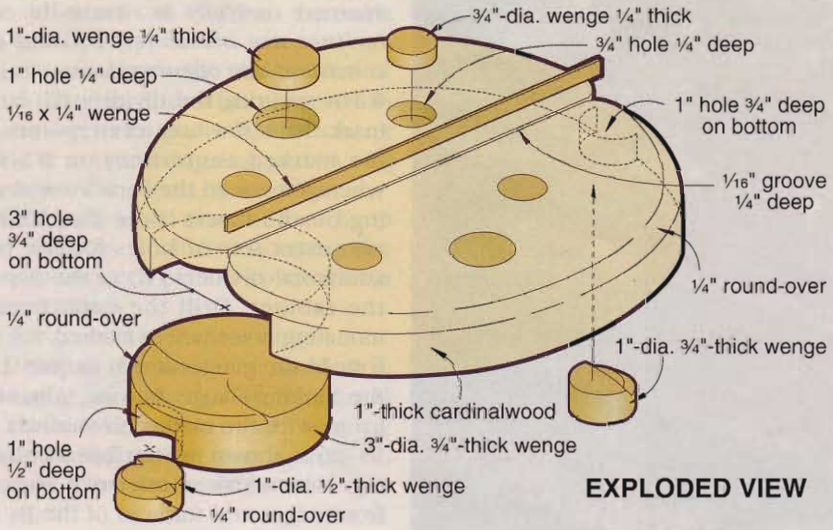
8 Remove the pattern, and sand the top surface flush. Then rout a ¼" round-over along the top edge.

Add the head and tail

1 Adhere a copy of the Head Full-Size Pattern to a ¾×3¼×3¾" piece of wenge. Using a Forstner bit, bore the 1" hole where shown. Scrollsaw or bandsaw the part, and glue it into the recess in the body. (Refer to the Exploded View drawing.)

2 Cut two 1"-diameter wenge discs, one ½" thick and the other ¾". Glue them into the bored recesses in the head and body.

3 Sand the bottom flush. Sand round-overs on the head and tail where shown. Finish, referring to *Tips on finishing your cutting board.*



EXPLODED VIEW

Tips on finishing your cutting board

1 Finish-sand the board, using progressively finer grits from 120 to 220.

2 Raise the grain. It's inevitable that a cutting board will get wet, so to minimize accidental grain-raising later, raise it now on purpose; then sand it off.

To do this, wet the board thoroughly. Let it dry overnight; then sand the fuzzy-looking swollen fibers smooth, using sandpaper one grit finer than the finest one you sanded the board with. Don't sand down into the wood under the swollen fibers.

3 Apply polyurethane or an oil finish. Polyurethane is a good choice for boards on which you'll build sandwiches, slice cheese with a wire cutter, or serve hors d'oeuvres, for example. This durable finish resists abrasion, wipes clean, and stands up to washing (and wet food) better than oil.

The difficulty of repairing damage to a polyurethane finish makes it a less desirable choice for a board that will see intensive slicing and dicing. An oil/varnish finish, such as Danish oil, works well here because you can repair the finish easily by applying more. (Washing and wear will ultimately remove an oil finish; you should reapply it as needed.)

As for safety, finishing expert Bob Flexner points out, "The Food and Drug Administration (FDA) lists all the common oils, resins, and driers used in these finishes as safe if the finishes are properly formulated. It's most likely that all commonly available 'oil' finishes are safe to eat off of, or to bring in contact with your mouth, once the solvents have evaporated and the finish has cured." No finishes are listed as "food-safe" by the FDA, he notes.

Edible oils, such as walnut oil, mineral oil, and vegetable oils, are sometimes suggested for kitchen utensils. But walnut oil cures slowly and mineral oil doesn't cure at all. Vegetable oils may turn rancid on the wood.

4 Finally, attach self-adhesive nonskid feet to the bottom of the board. They'll not only keep it from sliding around; they'll make it easier to pick up, too.

Project Designs: Dave Ashe
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: Hetherington Photography

The Apothecary's Friend

An Up-To-Date Version of an American Classic

In the days before pharmacy chains and mail-order prescription services, there was the local apothecary or pharmacist. This individual prepared all manner of remedies for ailments ranging from gout to mysterious fevers. And more often than not, he stored his antidotes in a cabinet very much like the one we've designed for you. Ours is great for storing all sorts of things. And it holds its own as a home accent piece, too.

Start with the birch plywood carcase

1 Cut the sides (A), top, bottom, and shelves (B), and dividers (C) to the sizes listed in the Bill of Materials. (We used birch plywood.) Note that all these pieces are the same width. For flush front and back edges later, set your tablesaw fence, and rip all pieces to width at the same setting.

2 Mark the screw-hole centerpoints and slots on the sides (A) where shown on the Parts View drawing and accompanying Slot detail on the *WOOD PATTERNS®* insert in the middle of the magazine.

3 Mark the divider location centerlines across the *bottom* surface of shelves B1–B5 and the *top* surface of shelf B6 where shown on the Parts View and the Divider detail accompanying the Carcase Exploded View. *Measure carefully to ensure the centerlines are accurately located for consistent-size openings later.*

4 For securing the dividers (C) later, mark the screw-hole centerpoints on the marked centerlines on B2–B6, where shown on the Parts View drawing on the insert. Note that B2 has two extra sets of holes for the two additional dividers (C) at the top of the cabinet. Drill the countersunk mounting holes where marked.

5 Build the gauge shown in Step 1 of the Marking Gauge drawing. Align the gauge with the marked centerlines on B1–B6 as shown in Step 2 of the drawing. Mark a pair of reference lines on front edges and surfaces of the Bs for

locating the dividers (C) later.

6 Locate and form the slots in the top (B1) for securing the top (H) later.

7 Mark the locations, and use a pocket-hole jig to drill the pocket holes in the dividers (C) and bottom surface of the ends of all the Bs. See the Parts View and Carcase Exploded View and accompanying Pocket-Hole and Divider details for reference.

8 Screw (no glue) the sides (A) to B1, keeping the top end of the sides (A) flush with the top surface of B1.

9 Construct a simple right-angle clamping support as shown on Installing the Dividers and Shelves drawing. Use the support to hold the dividers (C) in place and square to B1. Then, screw the four dividers in place. Use the reference lines marked earlier to accurately locate the dividers.

10 Position, clamp, and screw the second-to-the-top plywood shelf (B2) in place as shown *at right*.

11 Repeat the procedure in the preceding two steps to secure the remaining dividers (C) and shelves and bottom (B3-B6) in place.

Create a finished look with banding

1 Rip at least 30' of ¼"-thick strips from the edge of ¾" solid stock. (We found it easier to rip plenty of edging to start, and then cut the individual pieces to length from the long strips.)

2 Measure the lengths to fit your cabinet (these may vary from ours due to thickness of plywood), and miter-cut the banding (D, E) to length. Glue and clamp them in place, with the inside edges flush with the plywood carcase. Sand the outside edge of the banding flush with the outside of the carcase.

3 Cut banding (F, G) to length.

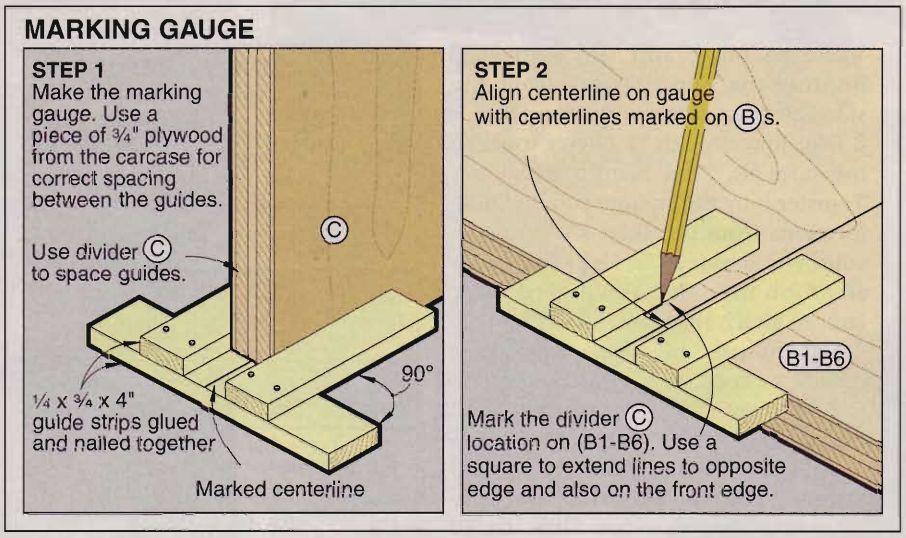
4 Cut a 1/16" rabbet 1/16" deep across the ends of the front face of banding strips F and G where shown on the Attaching the Banding drawing.

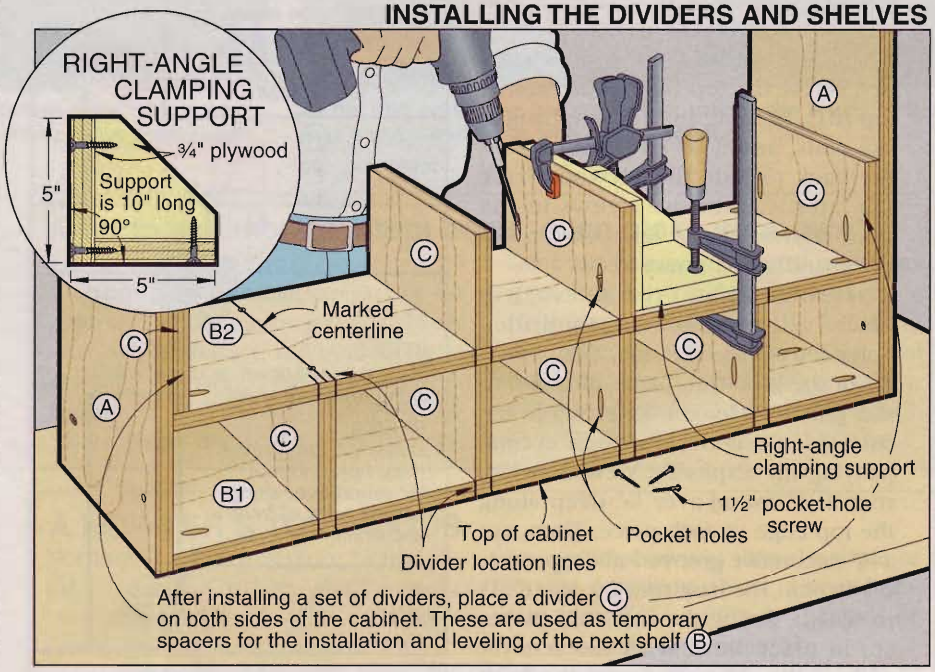
Outside case parts provide class

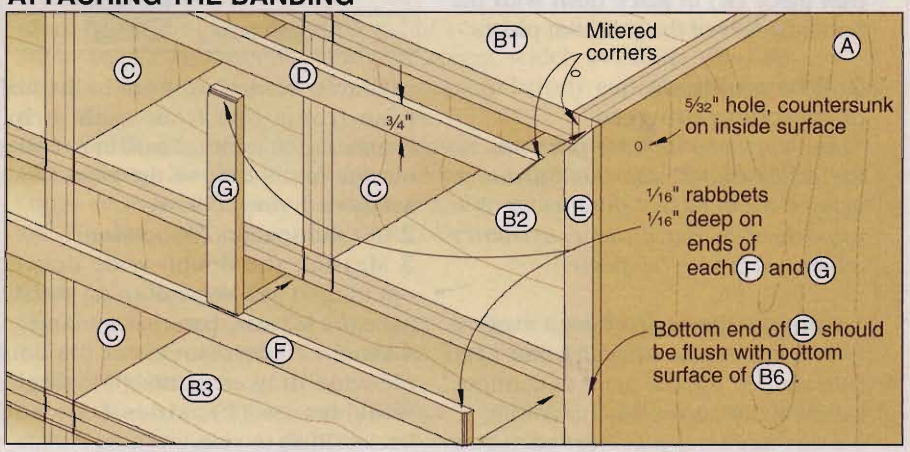
1 Edge-join enough 1 1/16" (five-quarter) cherry to form the top (H). Later, remove the clamps and trim H to the size listed in the Bill of Materials.

2 Referring to the Top Section View detail accompanying the Exploded

Continued


MARKING GAUGE
STEP 1
Make the marking gauge. Use a piece of ¾" plywood from the carcase for correct spacing between the guides.
Use divider (C) to space guides.
C
90°
¼ x ¾ x 4" guide strips glued and nailed together
Marked centerline
STEP 2
Align centerline on gauge with centerlines marked on (B)s.
B1-B6
Mark the divider (C) location on (B1-B6). Use a square to extend lines to opposite edge and also on the front edge.





The Apothecary's Friend

View drawing and the four-step Routing the Top drawing, rout the side and front edges of the top (H).

3 Edge-join enough ¾" cherry to make the sides (I). Trim them to final size. Transfer only the bottom slot and hole locations from the sides (A) onto the solid-wood sides (I). Drill the holes and form the slots. You'll need these later to attach the base sides (L).

4 Cut the base rail (J) to size, being careful to keep its length the same as the width of the assembled plywood carcase. Cut a ¾" rabbet ¼" deep across the back side of each end where shown on the Carcase Exploded View drawing. Drill the 10 mounting holes, and then glue and screw the base rail in place.

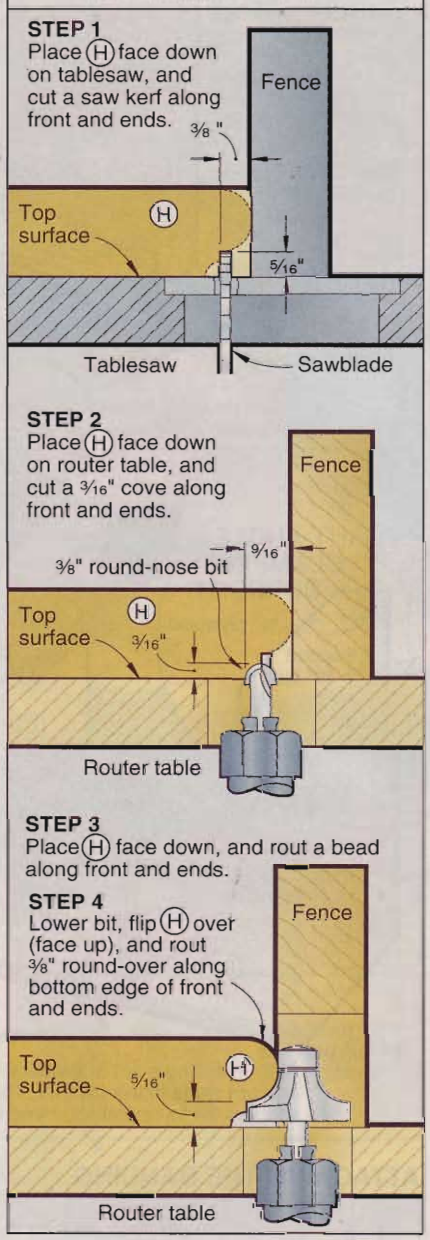
5 Working from the inside of the cabinet, screw the top (H) to the cabinet top (B1), keeping an even overhang at the ends, and a ¼" overhang across the back to hide the plywood back (X) later. Center the screws in the slots, allowing the solid-stock top (H) to expand and contract freely.

6 Screw (no glue) the sides (I) in place, using the previously drilled holes and slots in the sides (A).

7 Cut the base trim pieces K and L to size plus 1" in length. Referring to the Base Side Section View detail accompanying the Exploded View drawing, rout a ½" round-over ⅛" deep along the top edge of each piece. Then, cut a ⅛" decorative groove 1/16" deep.

8 Miter-cut the base trim pieces (K, L) to length. Screw the side trim pieces (L) in place flush with the bottom ends of the sides (I). Screw the front trim piece (K) in place flush with the bottom edges of the side trim pieces.

ROUTING THE TOP



Build a multitude of matching drawers

Note: You'll be making parts to create single and double-wide drawers, using the same-sized false fronts. It is important to maintain consistency when machining the parts.

1 From ¾" cherry, rip enough material to make the false drawer fronts (M). (We wanted the the grain to continue horizontally across all the fronts, so we cut one long piece for each row of drawer fronts.) Cut the individual false fronts (M) from each strip. Number each front for ease in re-laying out the fronts later so the grain flows across each row of drawers.

2 Cut the spacers (N) to size.

3 Measure the double-wide drawer opening. Two Ms and an N should measure ⅛" less than the opening.

4 From ½" birch stock, cut the double-wide drawer fronts (O), single-wide fronts (P), sides (Q), and backs (R, S) to size.

Continued

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
CARCASE					
A sides	¾"	10¼"	35¼"	BP	2
B top, bottom & shelves	¾"	10¼"	33"	BP	6
C dividers	¾"	10¼"	5"	BP	12
BANDING					
D banding	¼"	¾"	34½"	C	2
E banding	¼"	¾"	29½"	C	2
F banding	¼"	¾"	33"	C	4
G banding	¼"	¾"	5"	C	12
TOP, SIDES, AND BASE					
H* top	1 1/16"	12"	38"	EC	1
I* sides	¾"	11"	35¼"	EC	2
J base rail	¾"	5¾"	34½"	C	1
K* base front	¾"	5¼"	37½"	C	1
L* base sides	¾"	5¼"	11¾"	C	2
DRAWERS					
M fronts	¾"	4⅞"	5⅞"	C	25
N spacers	¾"	¾"	4⅞"	C	8
O fronts	½"	4⅞"	12"	B	8
P fronts	½"	4⅞"	5⅜"	B	9
Q sides	½"	4⅞"	9½"	B	34
R backs	½"	4⅛"	12"	B	8
S backs	½"	4⅛"	5⅜"	B	9
T bottoms	¼"	8¾"	12"	BP	8
U bottoms	¼"	8¾"	5⅜"	BP	9
DRAWER GUIDE/STOPS					
V guide	¼"	11 7/16"	9"	BP	8
W guide	¼"	4 13/16"	9"	BP	9
X back	¼"	34½"	29½"	BP	1

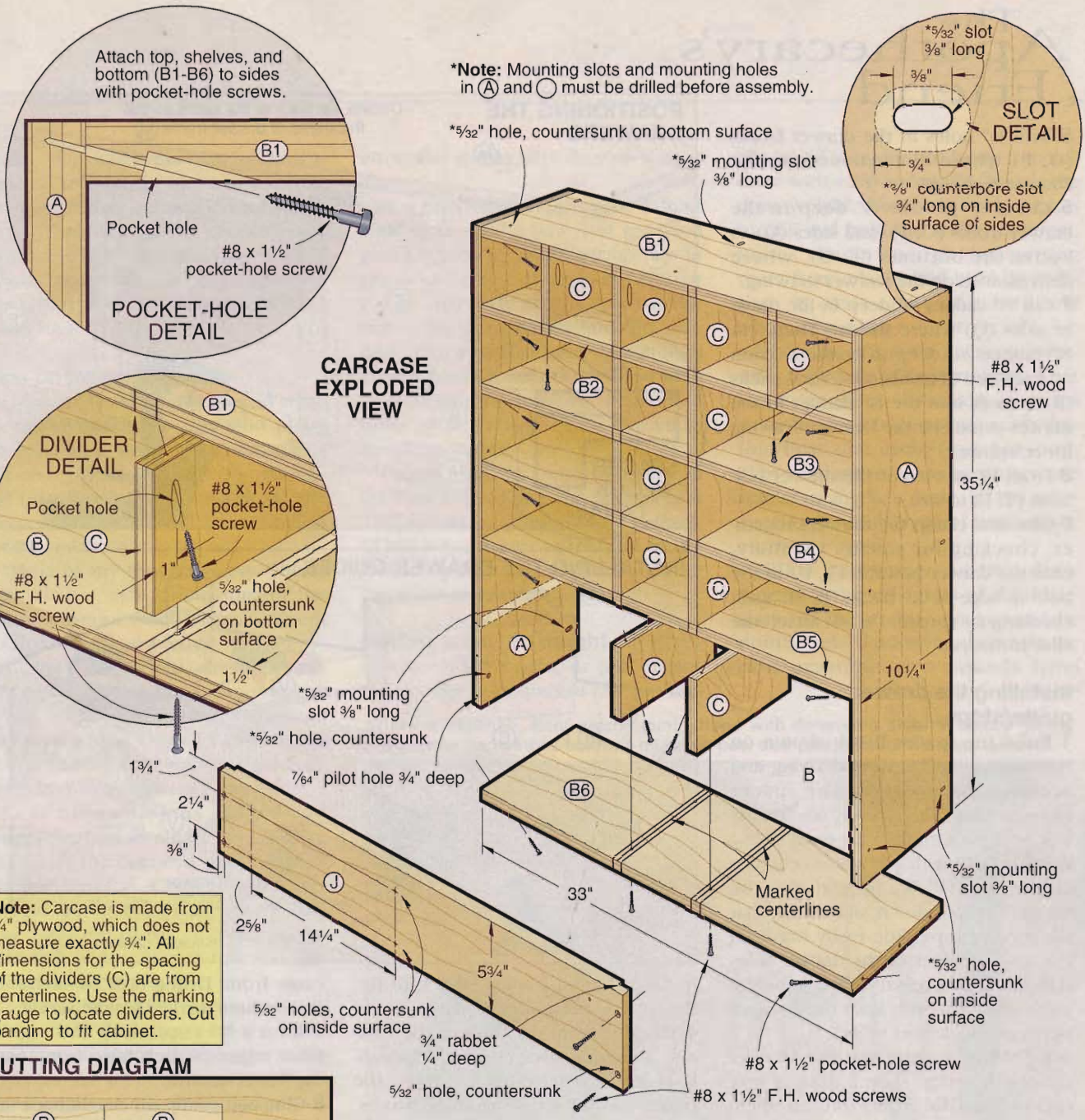
*Cut parts with an * oversize. Trim to finished size according to the how-to instructions.

Materials Key: BP–birch plywood, C–cherry, EC–edge-joined cherry, B–birch.

Supplies: #8x1½" pocket screws; #8x1¼", 1½", and 2" flathead wood screws; #6x⅝" flathead wood screws, #17x¾" wire brad, #17x1" wire brad, clear finish.

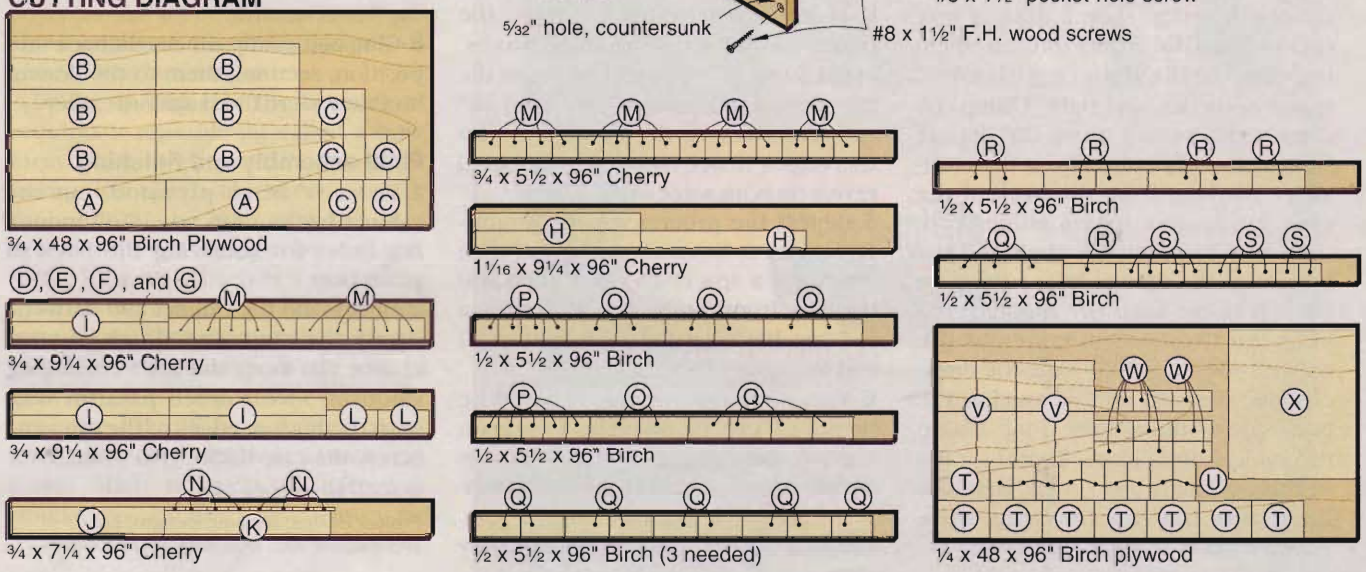
Buying Guide

Porcelain knobs. 25 ¾"-diameter porcelain cabinet knobs, catalog no. 130173, Woodcraft, 560 Airport Industrial Park, P.O. Box 1686, Parkersburg, WV 26102-1686, or call 800/225-1153 to order.



Note: Carcase is made from ¾" plywood, which does not measure exactly ¾". All dimensions for the spacing of the dividers (C) are from centerlines. Use the marking gauge to locate dividers. Cut banding to fit cabinet.

CUTTING DIAGRAM

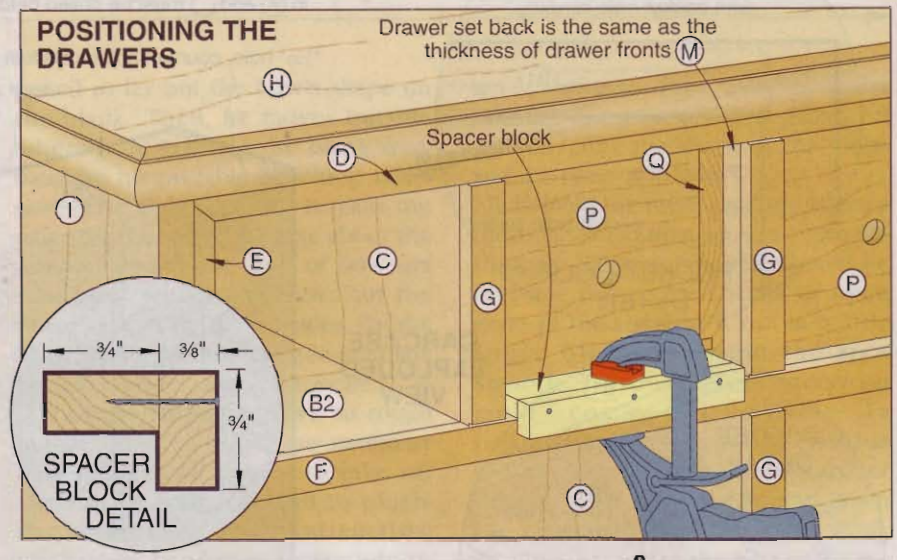

B B B B C C C A A C C
¾ x 48 x 96" Birch Plywood
Ⓓ, Ⓔ, Ⓕ, and Ⓖ
I M M
¾ x 9¼ x 96" Cherry
I I L L
¾ x 9¼ x 96" Cherry
N N J K
¾ x 7¼ x 96" Cherry
M M M M
¾ x 5½ x 96" Cherry
H H
1 1⁄16 x 9¼ x 96" Cherry
P O O O
½ x 5½ x 96" Birch
P O Q
½ x 5½ x 96" Birch
Q Q Q Q Q
½ x 5½ x 96" Birch (3 needed)
R R R R
½ x 5½ x 96" Birch
Q R S S S
½ x 5½ x 96" Birch
W W V V X T U T T T T T T T
¼ x 48 x 96" Birch plywood

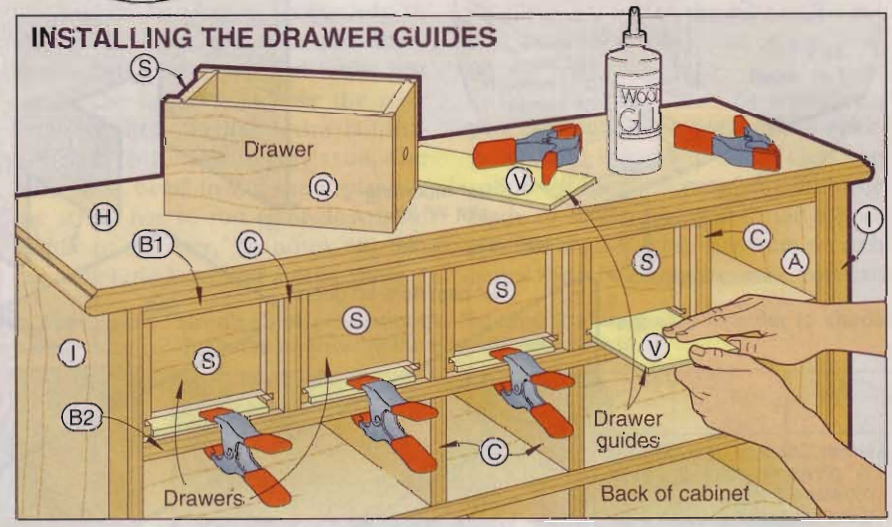
The Apothecary's Friend

5 Drill ½" holes in the drawer fronts (O, P) where dimensioned on the Drawer drawing.
6 Cut a ¼" groove ¼" deep in the drawer fronts (O, P), and sides (Q) to house the bottoms (T, U), where dimensioned on the Drawer drawing.
7 Cut ¼" dadoes ¼" deep in the drawer sides (Q) where shown. Then, cut ¼" rabbets ¼" deep to create a tenon on each end of fronts (O, P) and backs (R, S) to fit into the ¼" dadoes in the drawer sides. See the Drawer drawing for reference.
8 From ¼" stock, cut the drawer bottoms (T, U) to size.
9 Glue and clamp the drawers together, checking for square. Carefully, brad the drawer bottoms (T, U) to the bottom edge of the backs (R, S), again checking for square. Do not attach the false fronts yet.

Installing the drawer guide/stops

1 Build the spacer block shown on Positioning the Drawers drawing and accompanying detail. The spacer ensures that the false drawer fronts will be flush with the case front later.
2 From ¼" birch plywood, cut the guide/stops (V, W) to size. Flip the drawers upside down, and check that the guides/stops slide easily between the bottom edges of the drawer sides (Q). Sand if necessary. (We kept the guides 1/16" narrower than the distance between the drawer sides.)
3 Referring to Installing the Drawer Guides drawing, slide a drawer box (minus the false front) into an opening. Center the drawer with equal space to the left and right. Clamp the drawer spacer and move the drawer front against it, and recheck the clearance. Working from the back of the case, apply glue to the guide/stop, slide it in between the shelf and the bottom of the drawer box, resting on the top of the shelf (B) and centered between the bottom edges of the drawer sides. Carefully slide the drawer guide forward until it touches the back side of the drawer front. Clamp the guide/stop in place. Repeat for the rest of the single and double drawers. Later, after the glue has dried, drive ¾" wire brads in each guide from the front, and then from the back to further secure the guides in place.



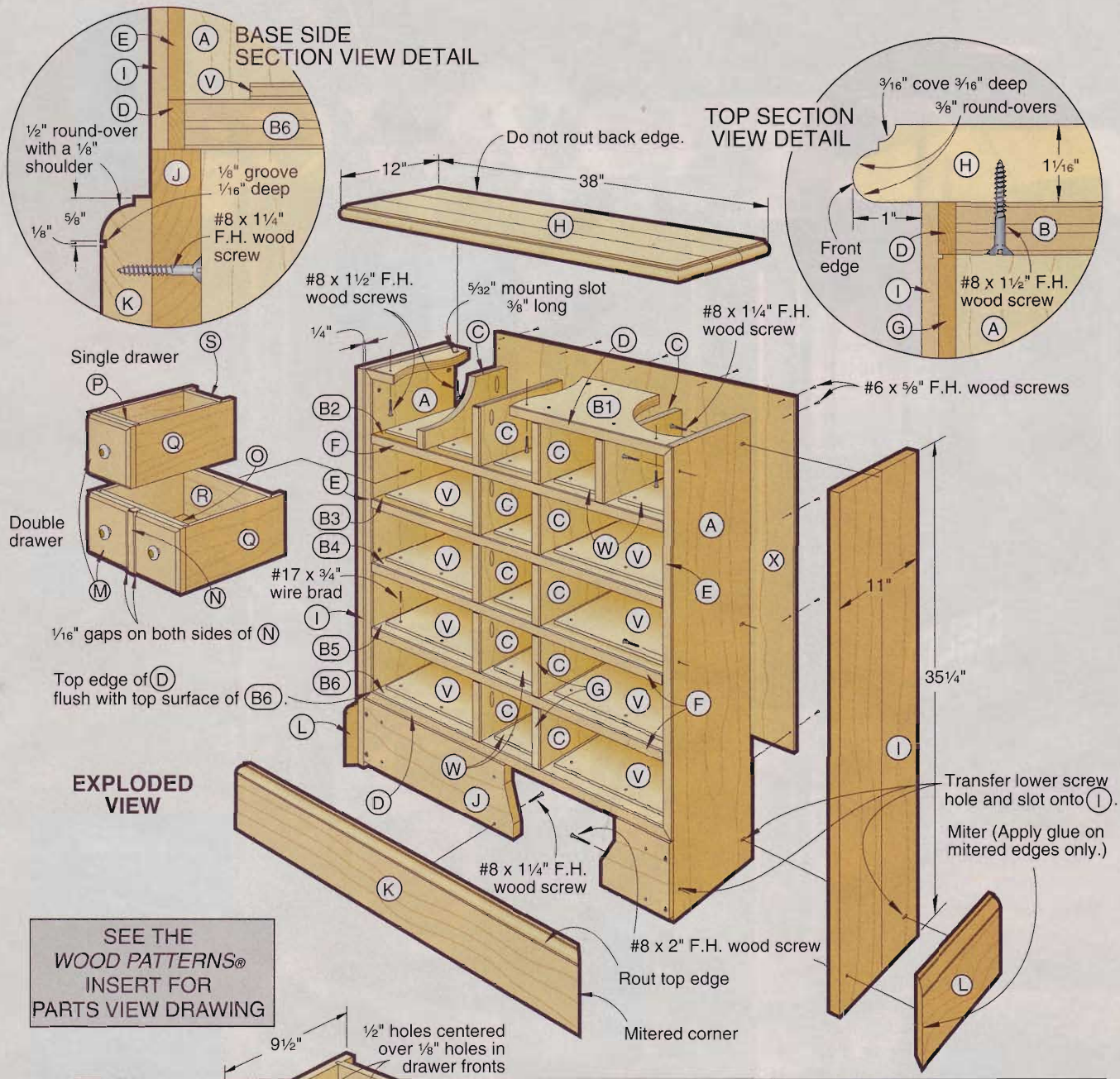


4 Working from the front of the cabinet, use double-face tape to temporarily secure the false fronts (M) to the fronts of the *single* drawer boxes, maintaining an equal gap between the false fronts and opening (we used 1/16" spacers). Remove the fronts and trim the edges if necessary for an equal reveal on both sides of each front.
5 Repeat the process for the double-wide drawer boxes, locating and then gluing on a spacer (N) first; then add the false fronts on each side, leaving a 1/16" gap between the false fronts (M) and the spacer (N).
6 Mark the centerpoints on the false fronts (M) to receive the porcelain knob screws. *Make sure your centerpoints align vertically and horizontally.* Remove the false fronts (M), keeping track of which drawer they came from. Drill a hole in each false front where marked for the screw.
7 Rout a ¼" cove along the outside front edges of each false front. Sand the fronts smooth.
8 Glue and clamp the fronts back into position, securing them to the drawer box they were fitted against earlier.

Final assembly and finishing

1 From ¼" birch plywood, cut the cabinet back (X) to size. Drill mounting holes for screwing the back in place later.
2 Finish-sand the cabinet and drawers. Apply the stain and finish of your choice. To keep the drawers sliding smoothly, we rubbed paraffin wax onto the bottom edges of the drawers. Screw the case back (X) in place.

Written by Marlen Kemmet
Project Design: Boelling Designs, Ltd.
Illustrations: Kim Downing; Lorna Johnson


BASE SIDE SECTION VIEW DETAIL
½" round-over with a ⅛" shoulder
⅛" groove ¹⁄₁₆" deep
#8 x 1¼" F.H. wood screw
⅝"
⅛"
TOP SECTION VIEW DETAIL
3⁄16" cove 3⁄16" deep
3⁄8" round-overs
1 1⁄16"
1"
Front edge
#8 x 1½" F.H. wood screw
Do not rout back edge.
12"
38"
#8 x 1½" F.H. wood screws
5⁄32" mounting slot 3⁄8" long
¼"
#8 x 1¼" F.H. wood screw
#6 x ⅝" F.H. wood screws
Single drawer
Double drawer
#17 x ¾" wire brad
1⁄16" gaps on both sides of N
Top edge of D flush with top surface of B6.
11"
35¼"
EXPLODED VIEW
Transfer lower screw hole and slot onto I.
Miter (Apply glue on mitered edges only.)
#8 x 1¼" F.H. wood screw
#8 x 2" F.H. wood screw
Rout top edge
Mitered corner
SEE THE WOOD PATTERNS® INSERT FOR PARTS VIEW DRAWING
9½"
½" holes centered over ⅛" holes in drawer fronts
¼" cove along front edges
¼" rabbet ¼" deep
Nut
4⅛"
¾"
¼"
⅞"
5⅞"
2⁷⁄16"
2¹⁵⁄16"
4⅞"
¼" groove ¼" deep
¼" dadoes ¼" deep
¼" groove ¼" deep
¼" rabbet ¼" deep
#17 x 1" wire brad
½"
⅛" hole, centered
1⁄16" gaps on both sides of N between Ms.
DOUBLE DRAWER
*Note: Drawers should be ⅛" narrower than drawer opening.
*5⅞"
Porcelain knob
SINGLE DRAWER

With the help of an amperage meter (left) and photo tachometer (right) we were able to measure amperage draw and cutterhead speed during various cutting tasks.

The Latest Generation of Portable Planers

We test 10 machines priced under $450

It's been more than a decade since the first portable planer (the Ryobi AP-10) was introduced. Before that, we had to rely on heavy, costly, tough-to-adjust, and even tougher-to-maintain stationary planers. But Ryobi's little dynamo, with its die-cast aluminum body, integral universal motor, and stamped-steel shroud, brought to our shops a down-sized thickness planer we could afford.

Once the AP-10 caught on, other tool manufacturers quickly joined the fray, offering their own portable planers. And, as often happens, competition brought improvements to the machines and, at the same time, kept prices in line.

To find out how the latest generation of portable planers perform, we brought 10 of them into our shop and ran them through a battery of detailed observations and tests. All of the planers have a maximum width capacity of 12-12½", except for the Ridgid with its 13" of width capacity.

Fast Facts

- All of the portable planers cut a high-quality surface finish that is comparable to that produced by stationary planers.
- The amount of snipe cut on the ends of a board by these machines has been reduced with new models, but not totally eliminated.
- Quick-change knife systems on some of these portable planers considerably reduce the time and skill required to install knives accurately.
- Portable planers are great for small jobs and finish planing. If you need to quickly hog off material on lots of rough-sawn stock, opt for a stationary planer instead.

A few words about our set-up and testing procedures

Once unpacked, the planers required little assembly—mostly attaching the handles. Next, to ensure that the machines would produce flat cuts, we checked that each cutterhead was aligned parallel to the planer's bed and that the knives laid parallel on the heads. For this we mounted a dial indicator upside down, then measured in the middle and at both ends of each head. A wooden block and an inexpensive feeler gauge would work just as well for doing this.

Four of our ten tested portable planers—the Craftsman, Grizzly, Powermatic, and Ryobi—did require some adjusting to bring their cutterheads to within .002" of parallel with the bed. But none of the machines were perfect, so spending some time (about 10 minutes) on this during set-up will pay dividends for a long time.

As part of each machine set-up, we timed how long it took to change the knives. (See the section "We like quick-change knives.")

Before starting the test, we ran each planer for 15 minutes with no load to ensure that the motor brushes were well seated. Then, using an amperage gauge, we measured the power draw of each under no load. At the same time we took cutterhead RPM readings with a photo tachometer.

For the surfacing tests, we selected 6"-wide pine and red oak boards that were relatively uniform and consistent. These boards were crosscut into 16" lengths, then jointed flat on one face. We also used 12"-wide cherry boards to test how well the planers handle full-width cutting loads.

A test consisted of three passes of each board through the planers at a 1/16" cutting depth. We took additional power draw and cutterhead RPM readings under this load, averaging the three readings.

What we learned from our test readings

In the chart at the end of this article, we note how the amperage draw and cutterhead speed changed for each machine as it encountered the cutting load. A powerful and efficient motor will draw fewer additional amps, and have a lower drop in cutterhead speed, than a lesser motor. Although it was a tight race for the most part, the Delta 22-560, DeWalt, Makita 2012, and Ridgid planers did slightly better than their peers in this test.

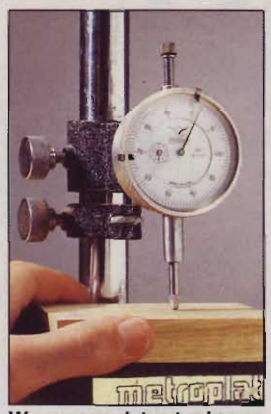
You'll note in the cutterhead-speed columns of the chart that the Makita 2012 is geared lower than the other planers. Its no-load speed—7,678 rpm—was the only no-load speed under 9,000 rpm. In a 1/16"-deep cut, it runs about 1,300 to 2,400 rpm slower than its competitors. Although a higher cutting rate generally equates to a higher-quality planed surface, the Makita produced surfaces as good as any machine in the test.

Continued

Portable Planers

Recent innovations help prevent snipe

Portable planers have traditionally had one vexing problem—snipe—the shallow divots that form on both ends of a planed board. (See photo at *right.*) Some woodworkers work around the problem by simply allowing extra length and then trimming away the snipe when they cut the workpieces to final length. We prefer to eliminate or at least minimize snipe to a point that we can lightly sand or scrape it away rather than cutting it off. (See the article on *page 94* for tips on reducing snipe.)



We passed test pieces under a stand-mounted dial indicator to measure snipe depth.

Not surprisingly, the manufacturers have worked to overcome the problem. Some, such as Craftsman, DeWalt, Grizzly, Jet, Powermatic, and Ridgid, now have four corner posts holding the motorized cutterhead rigidly to the base. Many of the earlier machines had just two centered posts.

All of the tested machines, except the Makita 2012, have tables at a fixed height; you adjust their cutterheads up and down to change the planing thickness. The Makita 2012 has a fixed head assembly and elevates the bed instead. It incorporates ball bearings where the elevation screws go through the table to stabilize the system. The Ryobi AP12, although it still relies on twin centered elevation screws, interlocks the head assembly with the case to give it greater rigidity. (Like the Makita 2012, the Ryobi AP12 will soon be replaced by a new model. See the sidebar "Two planers too new to test" on *page 60.*)

A quick twist of a side-mounted handle locks the cutterhead of the Delta 22-560.

To further ensure that the cutterhead remains stable during operation, Ridgid, Powermatic, DeWalt, and Delta (on the 22-560) added locking mechanisms that clamp the cutterhead in place. See photo *below left.* The Ridgid, Powermatic, and DeWalt also have extra-long infeed and outfeed extension tables for better material support.

So, have these design changes eliminated snipe? Yes and no. In our tests, seven of the ten planers produced snipe measuring .002" or less when taking a 1/16"-deep cut. This represents an improvement over the results we reported from our November 1996 test. At that time, snipe measurements ranged from .0005" to .006".

But let's put this problem into perspective. Snipe that's .001" deep will be barely discernible to the eye and you can sand it away easily by hand or with a palm sander. Snipe that's .002" deep calls for a more aggressive touch—we use a random-orbit sander to eliminate it. Snipe deeper than .003" gets cut off in our shop.

When we cranked down these planers to make aggressive, 1/32"-deep cuts, snipe depth increased by .001" or .002". Obviously, to keep snipe at a minimum, you must take light cuts, especially on the final pass. We also found that our snipe measurements ran .0005" deeper in soft pine than in the harder cherry and oak.

We like quick-change knives

If you dislike changing knives, you'll appreciate the nifty quick-change systems used on the Makita 2012, Powermatic, Delta 22-560, Ridgid, and Ryobi AP12. All have knives that self-align—you simply place them on the cutterhead and lock them down without making tedious adjustments. Time required: about five minutes.

The Makita knives have a full-length channel along the top face that aligns with a ridge in the lock bar that holds the knife. Put them together and the knives automatically fall into position on the cutterhead. Ridgid knives have a notch at each end that align with nibs on the cutterhead. The Delta and Ryobi planers use small oval-shaped holes in each knife that fit onto pins on their cutterheads to simplify indexing, as shown at *right.* Powermatic has a similar system, but its knives

Things to keep in mind about cutting capacity

All of the tested planers accept stock up to 6" thick, except the Grizzly, which goes 5" thick (which still strikes us as more than enough thickness capacity for these machines). And most of them have cutterheads that can be lowered to within 1/8" of their tables. If you want to plane stock thinner than 1/8", for safety and best results we suggest you attach the thin stock to a 3/4"-thick carrier board with double-faced tape.

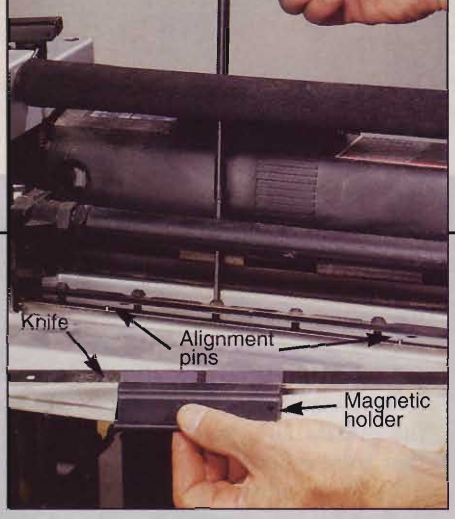
Although about half of the tested machines advertise a maximum cutting depth of 1/8", we recommend you make cuts this deep only when planing narrow (less than 3" wide) workpieces fed through the planer one at a time. When utilizing most of the cutting width of the machines, we recommend cuts no deeper than 1/16". If you go much deeper than that, the machines begin to bog down and cut quality suffers immensely. (These problems intensify as knives dull.) Heavy cuts also will shorten brush and motor life.

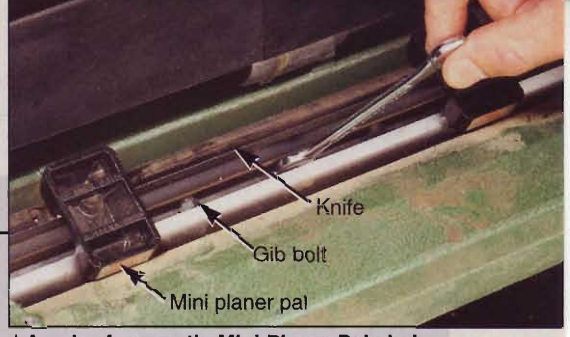
have round holes that don't allow you to move the knives laterally in case you nick them.

With the other machines in the test, you set the knife height with a supplied gauge, then lock the knife in place by tightening a series of fasteners, hoping the knife doesn't shift as you tighten it down. Setting the knives to within .001" of parallel took from 10 to 15 minutes on the DeWalt, and about twice as long as that on the other units in this group. With the Craftsman, Jet, Grizzly, and Delta 22-540, we reduced the changing time to the 10-15 minute range by using a set of Mini Planer Pals, a magnetic knife-setting jig (shown *far right*). (Item G3641, $29.95 plus shipping, from Grizzly Industrial, 800/523-4777.)

Other factors also affect knife-changing time. For example, to access the cutterhead and blades, you must first remove the chip chute. We found them easiest to remove on the Ridgid, Makita 2012, and Delta 22-560.

Knife changing also takes longer on the DeWalt because you must use two different wrenches and roll the cutterhead while you loosen and remove the knife bar screws. By comparison, on the Delta 22-560, Makita 2012, and Ridgid, you do this with the head locked in the correct position.





▲ **A pair of magnetic Mini Planer Pals help you change knives that don't self-align.**

◀ **A magnetic holder helps you position the oval knife slots over the pins on the cutterhead of the Delta 22-560. Its long wrench keeps your fingers well away from the sharp edges.**

The Delta 22-560 and Makita 2012 have another leg up in knife changing because the manufacturers provide wrenches that you can spin quickly for faster bolt removal. Ryobi and Powermatic also provide socket head wrenches, but unfortunately they only move the bolts a slow, one-quarter turn at a time. The other units use standard open-end wrenches that are slow and place your hands closer to the knives.

Knife alternatives affect your maintenance costs

With planer knives, you have two basic options—those you resharpen and those you throw away when dull. The DeWalt and Grizzly planers have knives with one edge that you can resharpen multiple times. All of the other machines have double-edged disposable knives. When one edge dulls you turn the knives around.

The disposable knives make a lot of sense to us. Considering that disposables cost about $35 per pair, and give you four sharp edges, you're money ahead compared to paying $10 to $12 per edge to have blades resharpened (assuming you know a good sharpener).

All of the tested planers come with steel knives except for the Makita 2012, which comes equipped with carbide knives—a big plus in favor of this machine. We were doubly impressed by the Makita knives because of their keen factory sharpness. The Delta and Ryobi blades also were excellent, but not quite as sharp as the Makita edges.

Beefy side handles on the DeWalt planer help you move it about.

The Powermatic has a dust chute contained within the main housing. This allows you to fully fold up the outfeed extension table.

Other features to consider before buying

• ***Portability.*** Weight and handle type dictate how easily you can tote these planers. Six of the ten machines weighed 60-70 pounds, one weighed less than 60 pounds, and two topped the scales at 80 pounds or more.

Most of the machines have side handles that make them easy to heft about with both arms, as shown at *left, top*. The DeWalt had the best handles, but those on the Ridgid, Powermatic, Grizzly, Makita, Jet, and Craftsman also worked well. We were less enthused about the center handle on the Delta 22-560. And the strap handles on the Ryobi and Delta 22-540 were uncomfortable to use.

• ***Storability.*** If you plan to stow away your portable planer when it's not in use, look for one with extension tables that conveniently fold up. As shown at *left, bottom*, planers with dust chutes tucked within their main housing enable you to completely fold up both extension tables regardless of the height of the cutterhead housing. You'll find this feature on the DeWalt,

Continued

Portable Planers

Makita, Powermatic, and Ridgid planers. With the other planers, you must crank up the head halfway or more to fold up the outfeed extension table.

• ***Dust collection.*** Planers produce mounds of sawdust in no time, so a dust-collection port for hookup to a shop vacuum or dust collector will save you lots of cleanup. Only the Powermatic comes with a dust port, but you can buy one for all the others except the Delta 22-540.

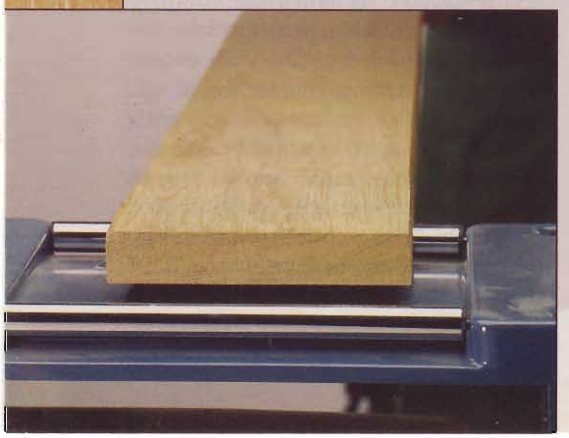
Dust collection also helps you produce smooth planed surfaces when making heavy cuts. Chips that don't exit a planer can recirculate through the cutterhead. These chips get dragged across the board surface, resulting in divots, as shown at *left*.

Depending on whether you currently own a shop vacuum or dust collector, you may want to consider the size of the accessory dust-collection port when making a buying decision. The Craftsman, Delta 22-560, Jet, and Powermatic models accept 4" hoses for connection to a dust collector. The DeWalt, Grizzly, Ridgid, and Ryobi connect to a 2½" shop-vacuum hose. The Makita 2012 port connects to an odd-sized hose intended for a Makita dust collector.

• ***Topside rollers.*** The Craftsman and Jet units are the only machines with rollers on top for passing just-planed boards back to the infeed side, as shown *below*. Although the DeWalt, Grizzly, and Ryobi planers don't have topside rollers, they do have broad, flat tops that work reasonably well for stock transfer.

◀ **Debris that doesn't exit the planer can mar a planed surface.**

▼ **Topside rollers, such as these on the Jet, provide a handy means of sending stock back for another planing pass.**



Two planers too new to test

Just as we were wrapping up this article, we learned of two new planers that will eventually replace models we tested. Both the Makita 3012 and Ryobi AP124 should be coming to stores soon, but current stocks of the Makita 2012 and Ryobi AP12 that they replace should be available for months to come. Although we were not able to obtain an AP124, we did get our hands on a prototype of the Makita 3012. But because Makita officials were still mulling changes to the machine, we didn't consider it fair to pit the prototype against the other production-model planers in our test.

MAKITA 3012

The 3012 has a knife-changing system that's similar to the highly-rated set-up on its predecessor, the model 2012 reviewed in this article. But unlike the 2012, the 3012 comes with steel knives (instead of carbide), and has a cutterhead that moves up and down rather than an elevating table. The Makita 3012 does not have a locking cutterhead, but its tables are on the long side at 30¼" from end to end. Whereas the 53-pound 2012 was made in Japan, the 61-pound 3012 is made in China, and should sell for about $470 according to Makita officials.

RYOBI AP124

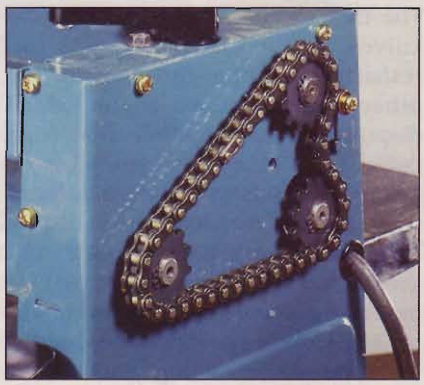
The Ryobi AP124 improves upon the AP12 in several areas. The AP124 retains the quick-change knife system of the AP12, but adds a cutterhead lock and a four-post design intended to reduce sniping. Ryobi moved the elevation crank from the side to the top of this newest model, and replaced the centered carrying strap with side handles for carrying comfort. The 67-pound AP124 is made in Taiwan and should retail for about $380.

And now, our recommendations

Because of its combination of attractive pricing ($330) and such features as quick-change disposable knives and head lock, we give our top pick to the **Delta 22-560**.

If you value a machine that's light in weight and has carbide knives, you may want to spend an extra $180 for the **Makita 2012**. Another thing we like: It's feed-roller chain drive (shown at *right*) and cutterhead belt were contained completely outside the planer housing (under an easy-to-remove cover). This keeps dust away and eases belt changing.

The **Ridgid** and **Powermatic** units were also solid performers, with snipe amounts about .001" less than the Delta 22-560. They give you better carrying handles, longer extension tables, and a few extras, such as the Powermatic's standard dust chute and Ridgid's extra capacity. Only you know if those things are worth $70 more to you.



The feed roller drive chain is housed away from dust on the Makita. (We removed its protective cover.) So is its cutterhead pulley (located on the other side of the planer housing and not visible here).

If you prefer resharpenable knives—perhaps you hone your own—take a look at the **DeWalt**. This well-made machine has no serious drawbacks.

Written by Bill Krier
Product testing: Dave Henderson
Photography: Marty Baldwin

10 PORTABLE PLANERS ON PARADE

BRAND	MODEL NUMBER	CUTTING CAPACITY: MINIMUM THICKNESS (INCHES)	CUTTING CAPACITY: MAXIMUM THICKNESS (INCHES)	TABLE LENGTH WITH EXTENSIONS (1)	KNIVES (2)	DEPTH-OF-CUT LOCK (3) (Y) YES (N) NO	STABILIZATION MECHANISM (4)	PERFORMANCE EVALUATION (5): EASE OF KNIFE CHANGING	CUTTERHEAD PARALLELISM (6)	KNIFE PARALLELISM (6)	SNIPE DEPTH @ 1/16" CUT (AVERAGE)	SNIPE DEPTH @ 3/32" CUT (AVERAGE)	AMP DRAW @ NO LOAD	AMP DRAW @ 1/16" CUT	AMP DRAW @ 3/32" CUT	HEAD SPEED RPM: NO-LOAD/LOAD (1/16" CUT)	PORTABILITY	WEIGHT (POUNDS)	WARRANTY (YEARS)	COUNTRY OF ASSEMBLY (7)	SELLING PRICE	COMMENTS
CRAFTSMAN	23378	1/8"	6"	22.5"	DE	N	FSP	F	.004"	.005"	.002"	.004"	7	8.9	12.8	9963/ 8369	G	61	1 yr.	T	$400	Machine is similar to Jet, but costs more. Has double-edged knives, but they are time-consuming to install. Top-side rollers prove handy.
DELTA	22-540	1/8"	6"	23.5"	DE	N	FSP	F	.002"	.002"	.004"	.005"	7	8.2	11.5	9904/ 8213	F	62	2 yr.	T	270	The predecessor to the 22-560, it lacks some of the 22-560's high-end features. Snipe was on the high side of tested planers. A low price makes it a good value.
DELTA	22-560	1/8"	6"	23.5"	DESA	Y	FSP/HL	E	.002"	.001"	.002"	.003"	7	9.3	11.2	9299/ 8082	G	65	2 yr.	T	330	The easiest knife changing of tested units, solid performance, and modest price makes it our top-value buy.
DeWALT	DW733	1/8"	6"	33"	SE	Y*	FSP/HL	G	.001"	.004"	.002"	.002"	6	10.3	12.8	9942/ 8628	G	75	1 yr.	T	430	A sturdy design, low snipe, and long extension tables make it a solid contender. Lacks quick-setting knives. On the heavy side.
GRIZZLY	G1017	5/32"	5"	20"	SE	N	FSP	F	.003"	.001"	.001"	.002"	7.2	9.2	11.8	9623/ 7888	F	80	1 yr.	T	400+30 shipping	A good-performing machine with low snipe. But relatively high price, 80-pound weight, and slow knife changes reduce its desirability.
JET	JWP-12-4P	1/8"	6"	22.5"	DE	N	FSP	F	.002"	.006"	.003"	.005"	7	9.5	13.1	9533/ 7535	G	61	2 yr.	T	300	See comments for Craftsman 23378.
MAKITA	2012	1/8"	6"	23"	DESA	Y#	ES/TMB	E	.001"	.005"	.001"	.002"	4	9	11.5	7678/ 6248	E	53	1 yr.	J	450	A favorite machine because of its light weight, standard carbide knives, and fast knife changes. The only machine with a table that elevates instead of cutterhead. Will be phased out by new Makita model 3012 in near future.
POWERMATIC	412	1/4"	6"	34"	DESA	Y	FSP/HL	E	.003"	.001"	.001"	.002"	7	8.8	12.2	9421/ 8097	G	67	2 yr.	T	400	Quick knife changes, long extension tables, low snipe, and standard dust chute make it another of our favorites.
RIDGID	TP1300	1/8"	6"	34"	DESA	Y*	FSP/HL	E	.001"	.001"	.001"	.002"	5.9	10.4	12	9940/ 8748	F	82	Life-time	T	400	Knife and cutterhead paralellism were nearly perfect. Snipe was low. A good value if you don't mind its weight.
RYOBI	AP12	1/8"	6"	18.25"	DESA	N	ES/CS	E	.004"	.001"	.003"	.004"	7	9.1	12.6	9478/ 7948	G	63	2 yr.	T	340	A good, but dated machine that will be replaced by new Ryobi model AP124. Has quick-setting, double-edged knives.

NOTES:

1. Total overall work support length.
2. (DE) double-edge
   (SE) single-edge
   (DESA) double-edge, self aligning
3. (*) Also has depth-stop turret for standard thicknesses.
   (#) Lock on elevation handle.
4. (FSP) four steel posts
   (HL) head lock
   (TMB) table-mounted bearings
   (ES) elevation screws
   (CS) case-sided support
5. E Excellent F Fair G Good P Poor
6. Measured before making any adjustments.
7. (J) Japan (T) Taiwan

FOR MORE INFORMATION, CALL:

Craftsman	Delta	DeWalt	Grizzly	Jet
800/377-7414	800/438-2486	800/433-9258	800/523-4777	800/274-6848
Makita	**Powermatic**	**Ridgid**	**Ryobi**	
800/462-5482	800/248-0144	800/474-3443	800/525-2579	

For specifications on other types of tools, click on "Tool Comparisons" at www.woodmall.com

Drop-Front Writing Desk A Stylish Way

The best traditional desk designs always have offered a way to organize paperwork, and just as important, to keep any clutter out of sight when you're not working. This writing desk succeeds on both counts. Our version—built of pine and finished with a colorful stain—has a decidedly country flavor, but you can use hardwood and a different finish to create a look all your own.

First, make the edge-glued panels for the larger parts

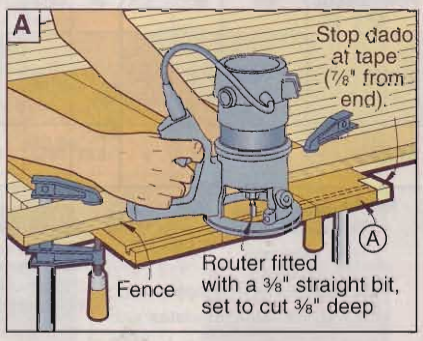
Note: This project involves a number of wide panels and shelves made from solid pine (see the Bill of Materials). Before machining any individual parts you'll want to glue up boards for these panels. If stock already is thicknessed to ¾", the edge joints must be aligned closely.

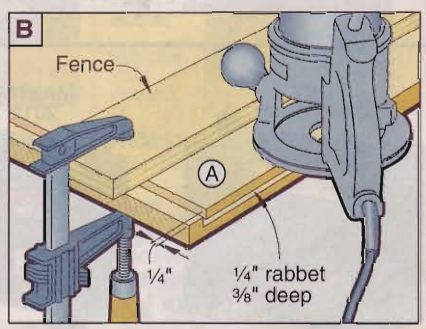
1 Glue up the necessary panels and shelves (A,B,C,D,Q). Then scrape off any dried glue squeeze-out, and sand the joints smooth.

2 Cut the desktop (A), the floorboard (B), and the side panels (C) to the sizes shown in the Carcase Parts View on *page 64*. Mark the "slant front" layout lines at the upper front corners of the side panels, but don't cut them yet.

Rout the dadoes and rabbets

1 Rout the ⅜"-wide stopped dadoes in the underside of the desktop and the upper face of the floorboard (Illus. A). Next, use the same straight bit to rout the rabbets along the rear edges of those same panels (Illus. B). Note that the rabbet on each panel extends only to the dado locations, not all the way to the ends.





To Get Organized

2 Using a ½"-radius round-over bit in your router table, rout the thumbnail profile on the front and end edges of the desktop and floorboard. (See the example in the inset drawing *below.*)

3 Clamp the side panels together and jigsaw close to your layout line for the slant front angle. Then clamp a straightedge on the line and true up the edges with a router and a flush-trim bit. (Separate the panels if your flush-trim bit isn't long enough to cut both edges at once.)

4 Install a ⅜" dado blade and a wood auxiliary fence on your tablesaw, and cut the tongue along the top and bottom edges of each side panel. (See the Tongue Detail drawing on *page 64.*) Make two passes (with alternate faces down on the saw table) so the tongue is centered on each edge. Use a handsaw and a chisel to cut the tongues shy of the front edge where indicated.

5 Designate the side panels as "left" and "right" so you can do the layout marking for the stopped dadoes to make mirror images. With their inside faces marked, clamp a straightedge guide in place and rout the dadoes. (Similar to the technique shown in Illus. A.) Use a chisel to square up the stopped ends of each dado.

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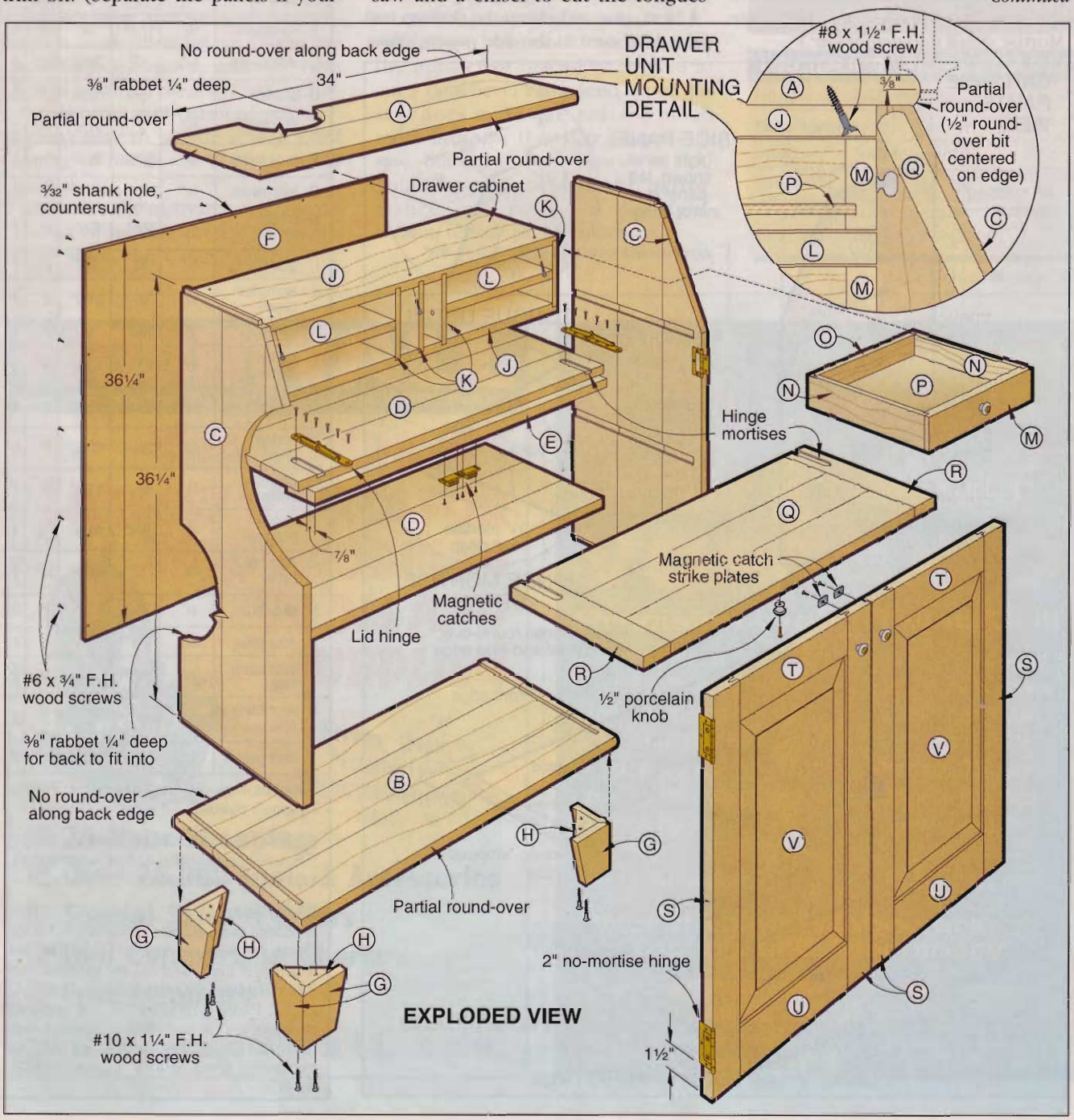


Writing Desk

6 Making sure you have them oriented correctly, rout (or saw) the full-length rabbet along the inside rear edge of each side panel (C).

Follow up with the shelves and carcase assembly

1 If you haven't done so already, trim the edge-glued panels for the upper and lower shelves (D) to size. These two parts measure the same size, but you'll mortise only the upper shelf for the drop-leaf hinges. (See the Hinge Mortise detail drawing *below*.)

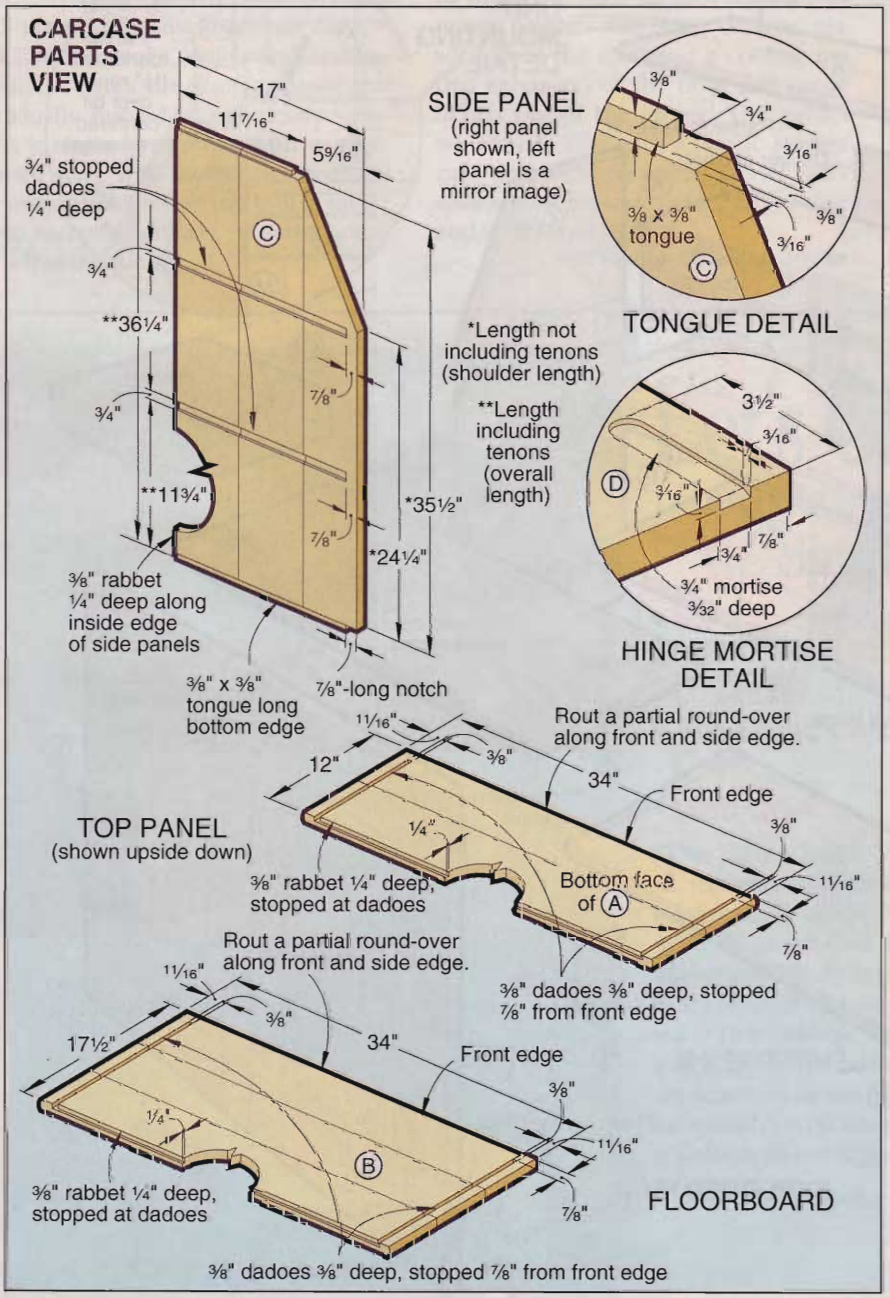
2 Clamp a straightedge guide and a stop-block near one end of the upper shelf, and use a ¾" straight bit to rout the mortise for the hinge. (See the Hinge Mortise detail and Illus. C.) Use a chisel to bevel the very edge of the mortise, creating clearance for the hinge knuckle. Repeat the same sequence for the other hinge and make sure they both fit properly, but don't install them yet.

3 After a quick test fit, glue and clamp the shelves into the dadoes in the side panels. Lay the assembly (back edges down) onto your workbench.

4 Next, glue and clamp the desktop and the floorboard to the side panels, fitting the tongues into their corresponding dadoes. Check for equal diagonal measurements to make sure the assembly is squared up; then let the glue dry.

Take care of the carcase details

1 Cut the filler strip (E), and glue it in place on the underside of the upper shelf, offset ⅞" from the front edge.



Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A desk top	¾"	12"	34"	EP	1
B floorboard	¾"	17½"	34"	EP	1
C side panels	¾"	17"	36¼"	EP	2
D shelves	¾"	15⅞"	32"	EP	2
E filler strip	¾"	2"	31½"	P	1
F back panel	¼"	32¼"	36¼"	Ply	1
G foot halves	¾"	4"	4"	P	8
H corner blocks	¾"	2¾"	2¾"	P	4
I glue blocks	¾"	¾"	3¼"	P	4
J top/bottom panels	¾"	10¾"	31½"	P	2
K uprights	½"	10¾"	6"	P	5
L drawer shelves	¾"	10¾"	12½"	P	2
M drawer fronts	¾"	2 3/16"	12⅜"	P	4
N drawer sides	½"	2 3/16"	10⅞"	P	8
O drawer backs	½"	1 9/16"	11⅞"	P	4
P drawer bottoms	¼"	9⅞"	11⅞"	Ply	4
Q drop leaf panel	¾"	12"	27⅛"	EP	1
R end caps	¾"	2½"	12"	P	2
S door stiles	¾"	2½"	22⅝"	P	4
T door upper rails	¾"	2½"	11 11/16"	P	2
U door lower rails	¾"	3"	11 11/16"	P	2
V door panels	½"	11½"	18 1/16"	EP	2

Materials Key: EP–edge-glued pine, P–pine, Ply–pine/fir plywood.

Supplies: #6×¾" flathead wood screws, #8×1¼" F.H. wood screws, #8×1½" F.H. wood screws, #10×1¼" F.H. wood screws, #17×1" wire brads.

Buying Guide

In addition to the supplies shown above, the following items (or appropriate substitutes) are required for this project. All are available from Paxton Hardware, P.O. Box 256, Upper Falls, MD 21156. Phone 410/592-8505. Brass-plated hinge/support (1 pr.), no. 5009, ½" porcelain knob (4), no. 6411, ¾" porcelain knob (3), no. 6412, no-mortise hinge (2 pr.), no. 4167, magnetic catch (2), no. 4401.

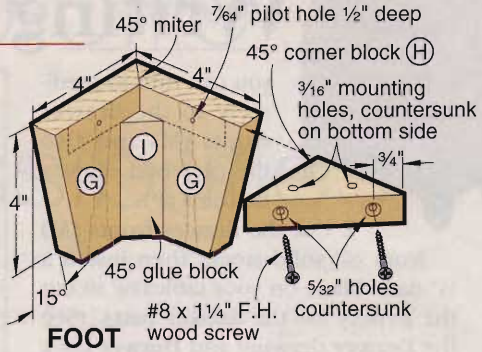
2 Cut the back panel (F) from ¼" plywood, and drill countersunk holes for the mounting screws. Temporarily fasten the panel with #6×¾" screws.

3 Cut eight 4"-square blocks of ¾" stock for the desk feet (G). These are actually halves that get glued up in pairs. (See the Foot drawing.) Then cut a 45° bevel on one edge of each half, for a miter joint.

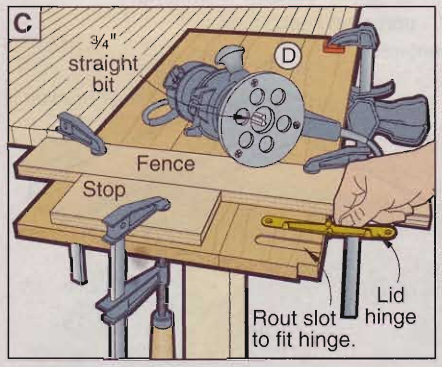
4 Before gluing up the feet, cut the 15° taper on the nonbeveled edge of each half. We used a simple hold-down jig with the miter gauge to make these cuts (Illus. D).

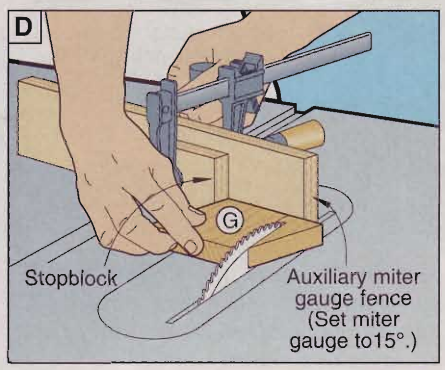
5 Cut the corner blocks (H) and glue blocks (I) for the foot assemblies, and drill the countersunk screw holes in the corner blocks as shown. Both of these pieces help reinforce the feet.

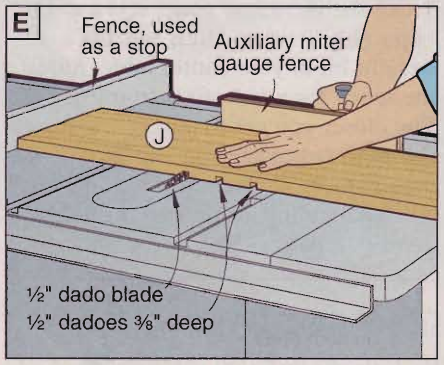
6 Glue and screw the parts together to make up the four foot assemblies. Then fasten them to the underside of the floorboard, ½" in from each corner edge.

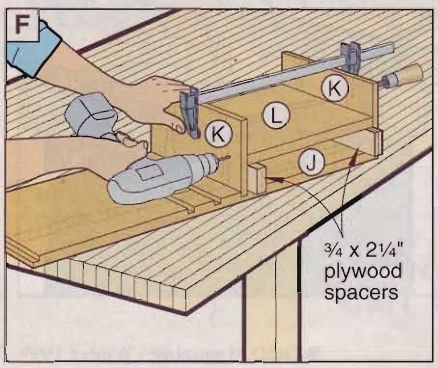


FOOT









Next step: Building the drawer unit assembly

1 From ¾" stock, cut the top and bottom panels (J) for the drawer storage assembly. Cut the drawer shelves (L) to the same width, but leave them ½" longer than the final dimension.

2 Install a ½" dado blade in your tablesaw to cut dadoes in the inside faces of the (J) panels. Center the first dado in each; then reset the rip fence as an end stop for the two outside dadoes (Illus. E). Finally, shift the fence closer, and add an auxiliary wood fence to cut the end rabbets on each panel.

3 Now mill the ½" stock you'll need for the five uprights (K), and cut these parts to size.

4 Trim the drawer shelves (L) so their length matches the distance between the end rabbets and the "outside" dadoes in the (J) panels.

5 Cut a pair of 2¼"-wide spacer blocks, and use them to support the drawer shelves while you fasten each one to a pair of uprights (Illus. F). Dry-fit the uprights for this step so you can remove the subassembly temporarily after the drawer shelf (L) is secured. The reason? The tight spacing between the uprights at the center of the drawer cabinet doesn't allow enough clearance to fasten the second drawer shelf if the other section is already in place.

6 Apply glue to the dadoes and rabbets and put together the drawer storage assembly. Secure everything with clamps and check for square. After the glue sets up, drill countersunk screw holes along the front and rear edges of the top panel (one at the center and one near each end), and fasten the cabinet to the desk carcase. (See the Drawer Unit Mounting detail drawing on *page 61.*)

Now build the drawers to fit

1 Cut the eight ½"-thick drawer sides (N) and four drawer backs (O); then

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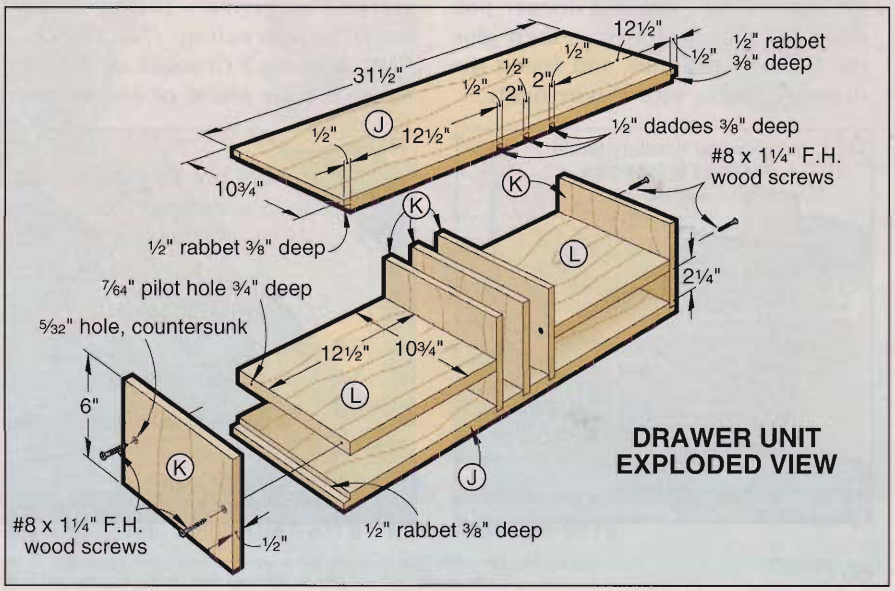


you can turn immediately to the drawer fronts (M) and also the plywood drawer bottoms (P).

2 Cut the drawer fronts (M) from ¾" solid stock; then install a ¼" dado blade on your tablesaw to cut the joinery for the drawer parts. (See the Drawer drawing and Drawer Lock Joint Detail drawing.)

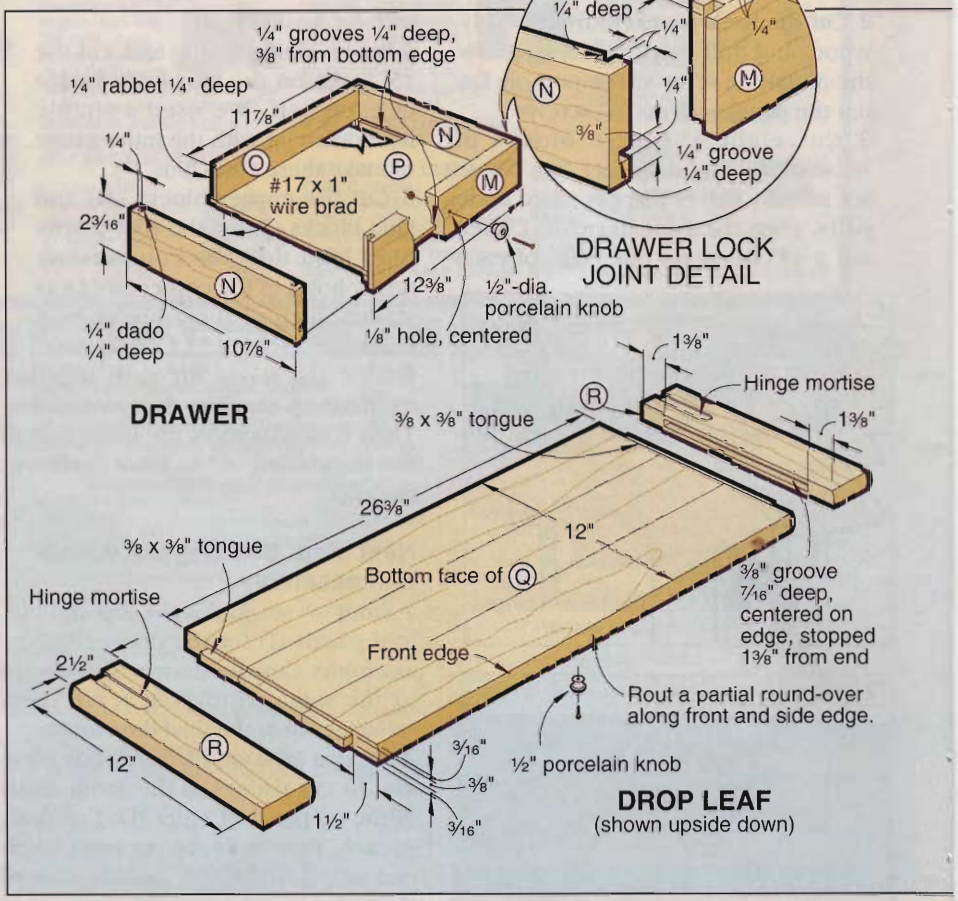
3 Mount a tall wood auxiliary fence on your tablesaw's rip fence, and with a follower block for support, cut the ½"-deep dadoes in the ends of each drawer front, as shown in Illus. G. This cut leaves two ¼"-thick tongues, both the same length, at each end.

4 Reset the auxiliary fence directly against the dado blade, but leave the blade height setting intact. Then guide the drawer front (face up) past the blade to cut away ¼" of the inside tongue on each end (Illus. H). With that done, drill holes for the knobs, and set the drawer fronts aside.

5 Lower the blade height to ¼" and cut the rabbets at the ends of the drawer backs (O). (Note that this joint differs slightly from that on the drawer fronts.) Remove the auxiliary fence, adjust the rip fence, and cut the lock joint dadoes in the drawer sides (N).

6 Shift the rip fence again to cut the grooves for the drawer bottoms. You want this detail in the drawer sides (N) and fronts (M), but not the backs (O). (The backs are cut narrower to sit atop the drawer bottoms.)

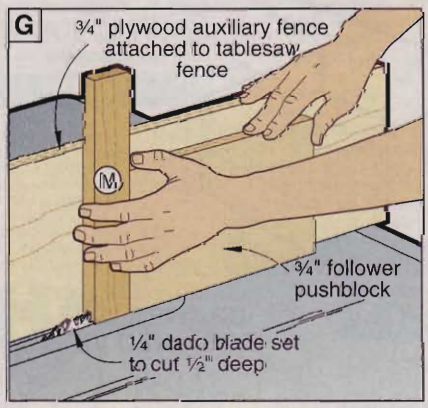
7 Dry-assemble a drawer to confirm the size of the plywood drawer bottoms (P). Cut those parts; then glue the drawers together, and fasten the drawer bottoms with 1" wire brads.

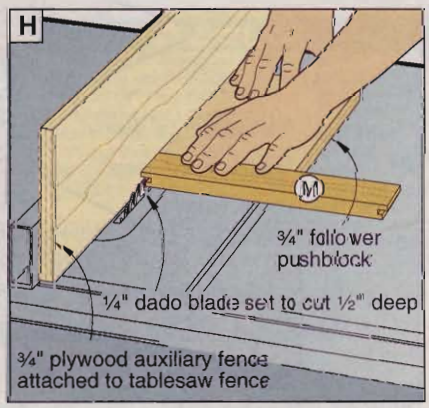


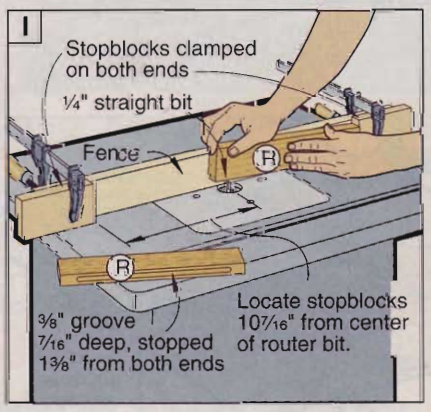
The drop leaf wraps up top half

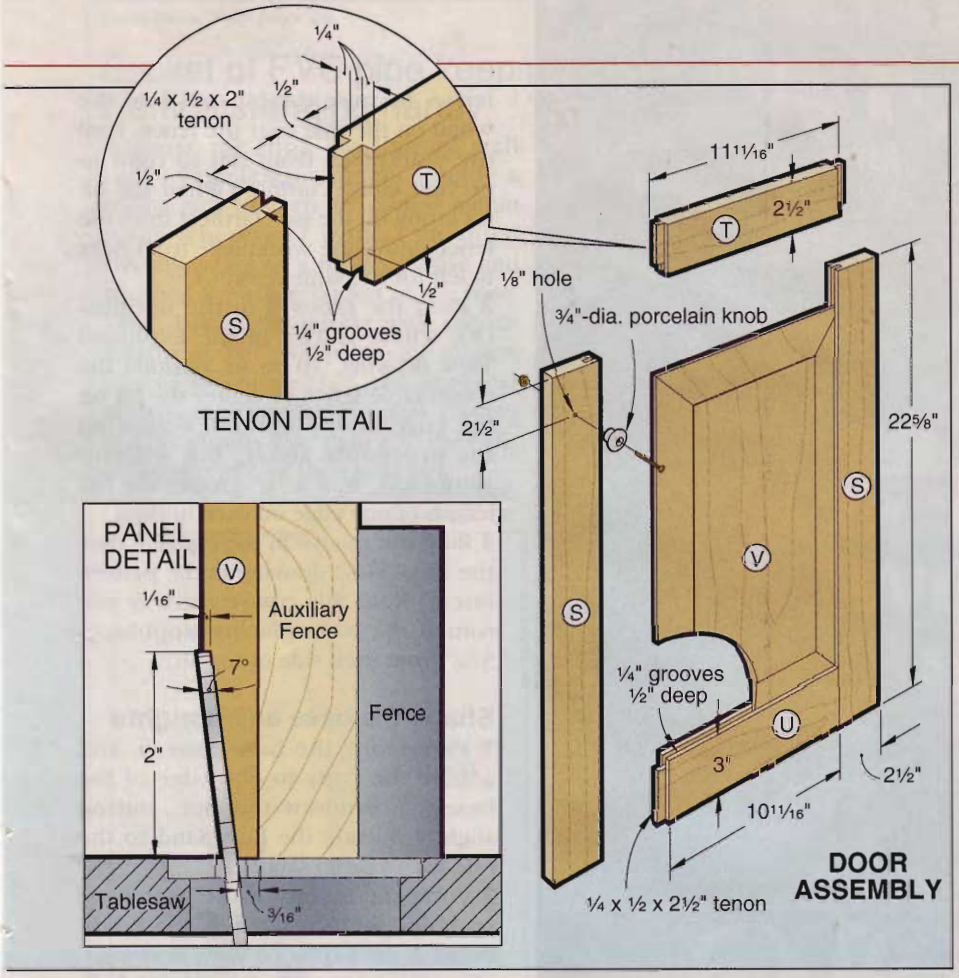
Note: The last component for the top section of the desk is the drop leaf (Q). Like the other large carcase pieces, this panel gets glued up from narrower boards, but it has an additional feature to keep it stable and flat. Two end caps (R) are fitted to the drop leaf (one at each end), a method sometimes called "breadboard" construction. (See the Drop Leaf drawing.) Grooves in the caps house a wide tenon or tongue from the center panel, which resists cupping but can still move relatively freely in response to seasonal changes in humidity.

1 Cut the drop leaf panel (Q) and the caps (R) to size; then set up a ¼" straight bit in your router table. Adjust the fence for a 3⁄16" offset from the bit. The closer you get to an exact setting, the better, but cutting the groove in two passes (alternating faces against the fence) will ensure it ends up dead-center on your stock.









2 Clamp stopblocks to the fence to index the ends of the drop leaf caps, and adjust the cutter height to about half the finished depth. Lower each cap onto the cutter for the first pass (Illus. I). Make another pass with the opposite face against the fence; then adjust the bit to full depth and repeat the process with each cap.

3 Use a dado blade on your tablesaw to cut the tongues on the ends of the drop leaf panel (Q). Fine-tune the cutting depth so that two passes (with alternating faces down) create a snug fit between these tongues and the end cap grooves.

4 Trim the tongues back 1½" from the edge of the panel as shown. Do a dry test fit first; then glue and clamp the end caps to the drop leaf panel. (Apply glue to only the first 3" of the joint at the hinge edge of the panel, to allow some "floating" of the wood.)

5 After the glue dries, clamp the drop leaf in place temporarily (in the open position), and transfer the locations of the hinge mortises in the top shelf (D) to the drop leaf caps (R). Rout and chisel the mortises as before; then install the hinges and check the fit. When closed, the drop leaf should just clear the front edge of the desk top (A) and rest against the drawer cabinet. Make any necessary adjustments, and install the knob.

Doors close up the lower half

Because a drop leaf design creates leg room while you're working at the desk, there's no need for the knee-hole feature common to fixed-top desks. Our design uses that valuable space for enclosed storage, tucked away neatly behind a pair of raised-panel doors. (See the Door Assembly and Panel detail drawings.) You can make them easily with just a tablesaw.

1 Cut the stiles (S), top rails (T), and bottom rails (U) to size.

2 Install a ¼" dado blade and cut the centered grooves in the inside edges of the stiles and rails.

3 Using the rip fence as an end stop and the miter gauge to guide the stock, cut the tenons on the ends of the top and bottom rails. (See the Tenon detail drawing.)

4 Plane additional stock to ½" thick and edge-glue boards for the door panels (V). After the glue joints are dry and sanded smooth, cut the two panels to finished size.

5 To bevel the door panels, first mount a tall auxiliary fence and a feather-board setup to steady the panels. Then tilt your sawblade to 7°, as shown in the Panel detail drawing. Cut the bevels with the panel on edge, doing the ends first to prevent tearout; then sand off the saw marks.

6 After a dry run to fit the parts, glue up the door assemblies. Like the drop leaf panels, the raised panels need room to shrink and expand within their frames, so apply glue to only the center of each panel end. Make sure each door is square and flat before you set it aside for the glue to dry.

7 Install the hardware for the doors. This includes the knobs, no-mortise hinges, and—after the doors are hung—the magnetic catches.

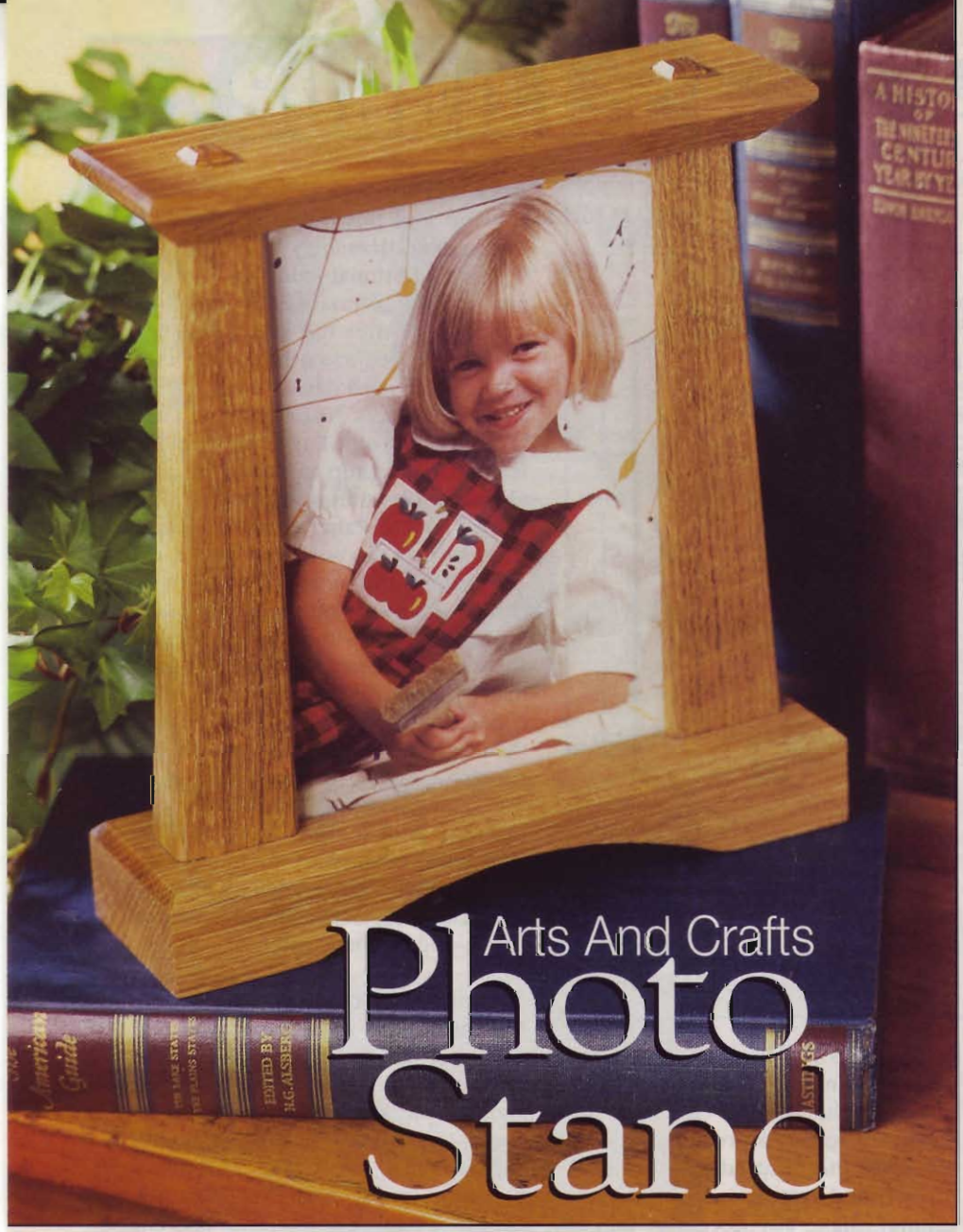
To finish, undo hardware first

1 Remove the hardware from the doors and the drop leaf, and also the screws holding the drawer cabinet and the carcase back panel in place. Finish-sand all of these components and also the desk carcase.

2 For the first stage of our finish, we applied a stain conditioner to prevent blotching of the pine. Next came a waterborne "Antique Red" stain (from the Accents line by Minwax) for the carcase, drop leaf, and doors. We opted for no stain on the drawer cabinet and drawers, but you can decide on the look you want.

The stain required about 4-6 hours drying time; then we followed up with two coats of satin polyurethane on the entire project. After allowing 24 hours drying time for the second coat, we reinstalled all the hardware, and reassembled the desk. The drawers and pigeonholes aren't crammed full yet, but even when they are the closed desk will still look sharp.

Written by Bill LaHay
Photography: Baldwin Photography
Illustrations: Kim Downing; Lorna Johnson



Arts And Crafts

Photo Stand

Frame a favorite photo in oak

A prized photo calls for a special frame. Here's a handsome one of oak that fills the bill. What's more, it's quick and easy to build.

Rout grooves in all the parts

1 Cut the base (A), uprights (B), and cap (C) to the dimensions shown in the Bill of Materials.

2 Rout a centered 7/32" groove in the base (A), where shown on the Base Full-Size Pattern in the *WOOD PATTERNS*® insert. To rout the groove, install a 1/8" straight bit in your table-mounted router. Adjust the cutting depth to 3/16", and position a fence to center the bit on the face of part A.

Clamp stopblocks to the fence 6½" from the right side and left side of the bit. Then, with one end of the base against the left stopblock, lower the workpiece onto the spinning router bit. Slide the part to the other stopblock. Turn the base end for end, and repeat the operation.

To widen the groove, move the fence slightly toward the bit. Rout the base again, making one pass with each edge of the base against the fence. Because the bit cuts into the wood on the side near the fence, feed the workpiece from left to right to prevent climb cutting. (When the bit is cutting on the side farthest from the fence, move the workpiece from right to left for the same reason.)

3 Rout the grooves in the uprights (B), where shown in the Exploded View drawing. To do so, position the router-table fence to center the bit on the edge of one upright. Following the procedure above, but without stopblocks, rout a 7/32" groove the full length of one edge on each upright.

4 Rout the groove in the cap (C). (See the Parts View drawing in the pattern insert.) Rout this groove the way you routed the base, placing stopblocks 5 7/16" from each side of the bit.

Shape the base and uprights

1 Photocopy the base pattern, and adhere the copy to one edge of the base (A). Bandsaw the arch, staying slightly outside the line. Sand to the line with a drum sander.

2 Form the tenon on the bottom of each upright (B), shown in the Tenon detail of the Exploded View drawing.

To saw the tenons, install a 3/8" dado blade on your tablesaw. Attach a scrapwood auxiliary fence to the saw's rip fence, and cut into it with the dado blade. Adjust the blade to cut a 17/64" rabbet 3/16" deep on each face of the upright. Back each piece with scrapwood to prevent chipout.

Reset the fence to saw a ¼" rabbet 3/16" deep on the ungrooved edge of each upright. Ease the outer corners of the tenons with a chisel to make them easier to fit into the routed groove in the base.

3 Cut a piece of scrapwood to size and rabbet the edges as shown in the Rabbeted Insert drawing in the *WOOD PATTERNS* insert.

4 Place the rabbeted insert between the two uprights (B), and clamp the assembly together.

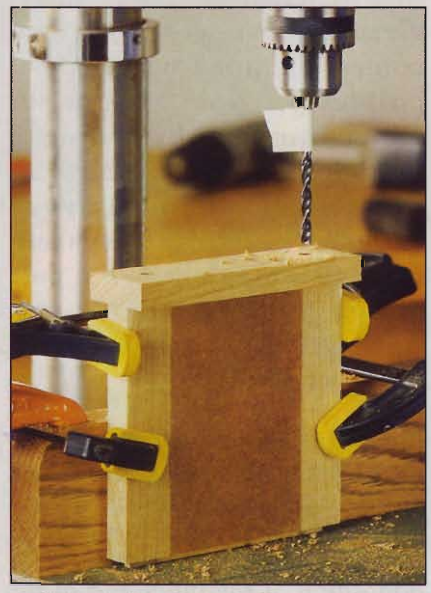
Drill holes for the dowels

1 Referring to the Parts View drawing, mark the dowel hole locations on the cap (C). Temporarily fasten it in place with double-faced tape atop the assembled uprights and insert.

2 Position the assembly on your drill-press table, centering the bit over the mark at one end. Clamp the assembly to a fence on your drill-press table, as shown *below*. Drill the ⅜" counterbore and ¼" holes as shown. Reclamp, and drill the other end.

3 Remove the cap, and enlarge the holes in the uprights to 17/64".

4 Square up the ⅜" counterbores in the cap. A sharp chisel will do the job.



Drill the holes through the cap into the uprights with a drill press. Tape on the twist drill serves as a depth indicator.

Now, make it picture-perfect

1 Fasten the uprights together with double-faced tape. Adhere the Upright Full-Size Pattern to the stack. Bandsaw the tapered edge slightly outside the line, and sand to it with a disc sander.

2 Install a chamfer bit in your table-mounted router. Rout the 1/16" and ⅛" chamfers where shown. A miter gauge and extension will help when routing across the ends of the base (A) and cap (C).

3 Rout the 7/16" chamfer on the underside of the cap (C). (We cut the deep chamfer in 1/16" increments.)

4 Glue the dowels into the cap holes.

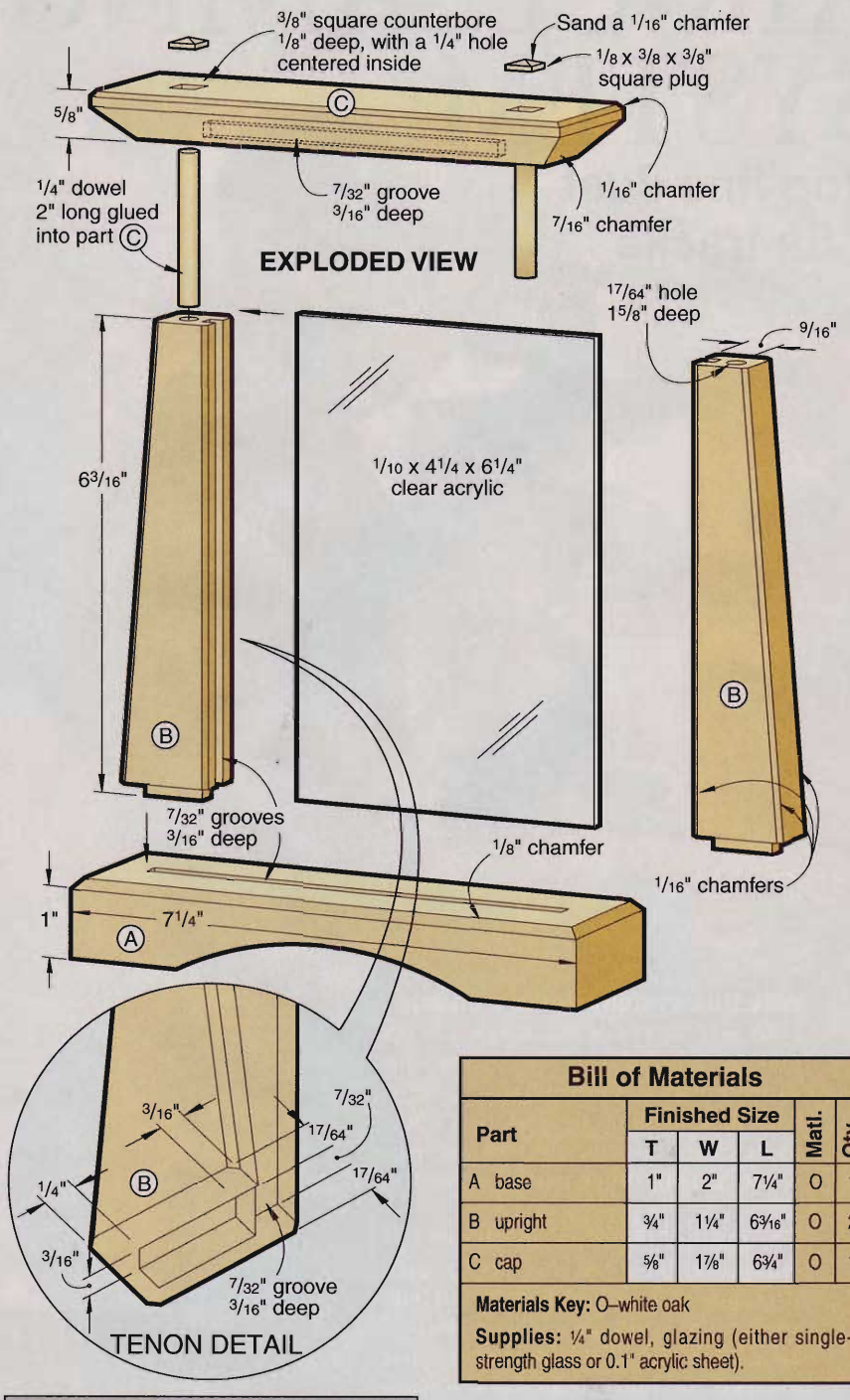
5 Finish-sand the base and uprights.

6 Glue and clamp the uprights into the base, placing the rabbeted insert between the uprights to square them. Insert the cap dowels into their holes in the uprights for spacing. (Do *not* glue the dowels into the uprights.)

7 Cut a piece of stock ⅜×⅜×6". Sand 1/16" chamfers at both ends, and cut a 3/16" length off each end to make the plugs. Glue them into the square counterbores in the cap.

8 Finish-sand the cap. Apply a clear finish to all parts.

9 Cut two pieces of glazing material (either single-strength window glass or 0.1"-thick acrylic) to 4¼×6¼". Sandwich your photo between the two sheets, slide them into the grooves, and install the cap to complete the frame.



SEE THE *WOOD PATTERNS*® INSERT FOR FULL-SIZE PATTERNS

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
A base	1"	2"	7¼"	O	1
B upright	¾"	1¼"	6 3/16"	O	2
C cap	⅝"	1⅞"	6¾"	O	1

Materials Key: O–white oak

Supplies: ¼" dowel, glazing (either single-strength glass or 0.1" acrylic sheet).

Project Design: Schlabaugh and Sons; Jan Svec
Illustrations: Roxanne Lemoine; Lorna Johnson
Photographs: Steve Struse;
Hetherington Photography

WHOLE-SHOP AIR-CLEANING SYSTEM

Stop fine dust in its tracks

Your grandfather might have scoffed at the measures we take to curb workshop dust because in his time, few knew about the health hazards. These days, virtually every power tool comes equipped with a dust-collection port, but what about those pesky airborne particles that make a mess of everything, including your lungs? This simple system traps floating debris in a pair of commonly available furnace filters to keep dust under control.

Why this system works wonders

Most self-contained filtration systems pull the filthy air from one area of your shop, clean it, and exhaust it right back into the same area. So, they effectively clean the same air over and over while leaving other particles floating around the shop.

By putting the filter and blower at opposite ends of the shop, our system stretches that airflow loop to include your entire work area. The exhausted air directs any airborne debris that escaped the initial draw back toward the filter, giving the filter another chance.

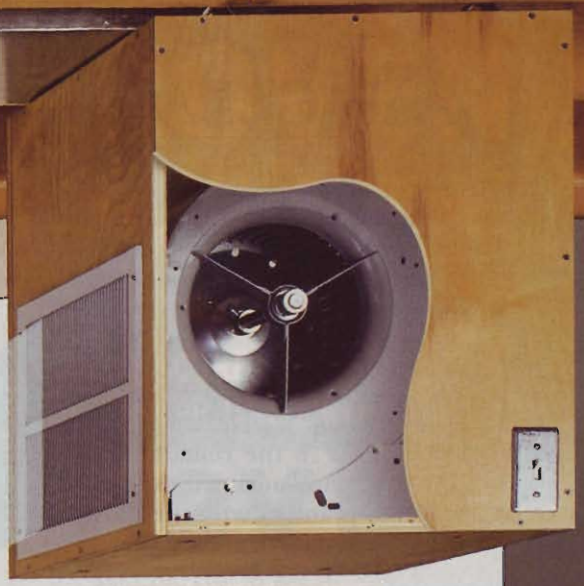
First, find the best mounting locations in your shop

Ideally, you'll want to locate the filter cabinet over your dustiest work area with the blower cabinet directly opposite it at the other end of the room. This configuration circulates shop air, capturing the debris before returning the freshly scrubbed air to your work area.

If ceiling-hung obstacles make alignment impossible or impractical, you can add elbows to the duct to get around them. Just remember that every additional bend slightly reduces the airflow, and thus the efficiency of the system.

Construction starts with building a box for the blower

*(**Note:** Although we purchased our blower/motor new, you can save money by buying a used unit from a heating and cooling contractor. Make sure to get one with a free-air delivery rate of at least 1,500 cubic feet per minute. And, you may need to resize the blower cabinet accordingly. See the Buying Guide in the Bill of Materials for the blower/motor we used.)*



1 Cut the blower-cabinet bottom (A), top (B), front (C), back (D), and sides (E) to the size shown in the Bill of Materials.

2 Center the blower/motor on the bottom (A), placing the blower's exhaust outlet flush with the panel's front edge. Stand the front panel (C) against the bottom and blower, and trace the exhaust outlet on the front panel. Cut a hole along the outline to accept the exhaust outlet.

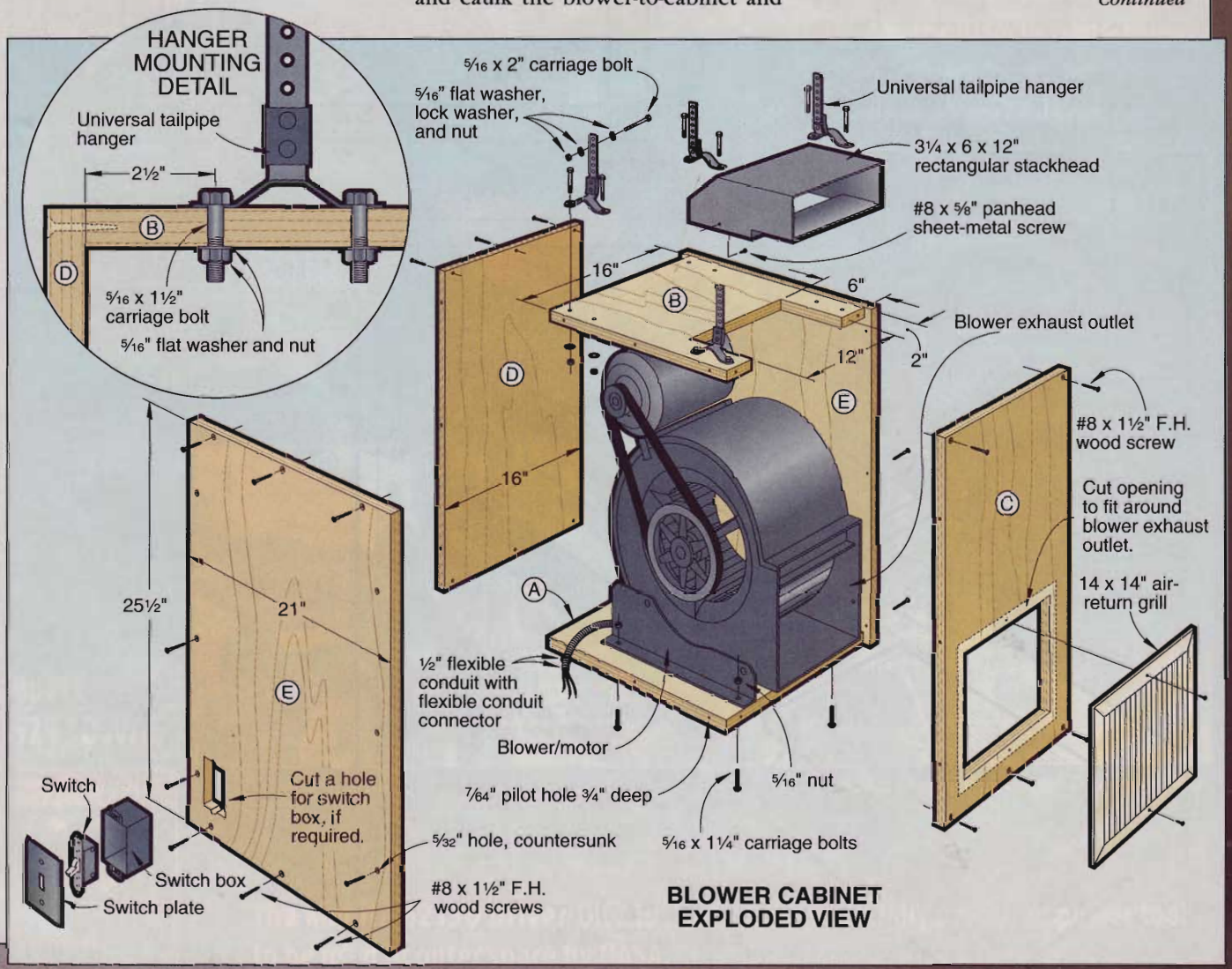
3 Move the blower/motor forward so that the exhaust outlet overhangs the front edge of the bottom panel by ¾". Mark the blower/motor mounting holes, remove the unit, and drill 5/16" holes at each mark. Bolt the blower/motor in place.

4 Cut the 6×12" opening in the top panel (B) and secure the rectangular stackhead to the inside edge of the cutout with sheet-metal screws. Seal around the stackhead with acrylic caulking. Mount four universal tailpipe hangers, as shown in the Hanger Mounting detail *below*, spaced so that the straps will attach to the insides of the mounting joists.

5 Attach the front (C) and back (D) panels to the top (B) and bottom (A), and caulk the blower-to-cabinet and stackhead-to-cabinet joints. Fasten one side panel (E) to the pieces of the cabinet already assembled.

6 Sand and apply finish to the exterior of the cabinet and the remaining side panel (E). After the finish dries, install the air-return grill so the louvers point

Continued



BLOWER CABINET EXPLODED VIEW

AIR-CLEANING SYSTEM

to one side as shown in the Blower Cabinet Exploded View drawing on the *previous page*. By orienting the louvers this way, you'll get better total-shop air movement. (Directing the louvers toward the floor only stirs up more dust.)

7 Mount the power switch in a convenient location. We cut a hole for the switch box in the remaining side panel and flush-mounted the switch. You may want to wire the blower/motor to a remote switch near your work area. In this case, attach a junction box instead of a switch box to the conduit connector.

Next, fashion the filter cabinet

(Note: We designed the filter cabinet to nestle between open overhead joists, so we ran the ductwork out one end. You can easily modify the design to exhaust from the side or top if you wish.)

1 Cut the filter cabinet front (F), back (G), top (H), and sides (I) to the size shown in the Bill of Materials. Using the Part View at *right* as a guide, cut an opening in the front panel to accept the 3¼×12" wall stack. (The stack's size may vary slightly, so cut the opening to its actual size.)

2 Assemble the parts as shown in the Filter Cabinet Exploded View. Sand and finish the outside of the cabinet.

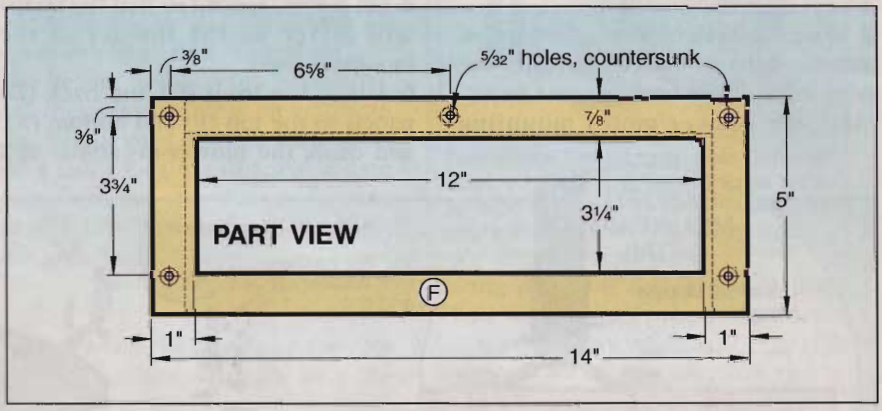
3 Cut the filter tracks (J, K) from sheet metal (we used galvanized-steel flashing), and shape them as shown in the Filter Cabinet Exploded View. (See the photos on the *opposite page* for a simple method of braking the tracks.) Attach the tracks to the sides (I) and back (G) with sheet-metal screws, allowing just enough space between the tracks and the cabinet for the stacked filters.

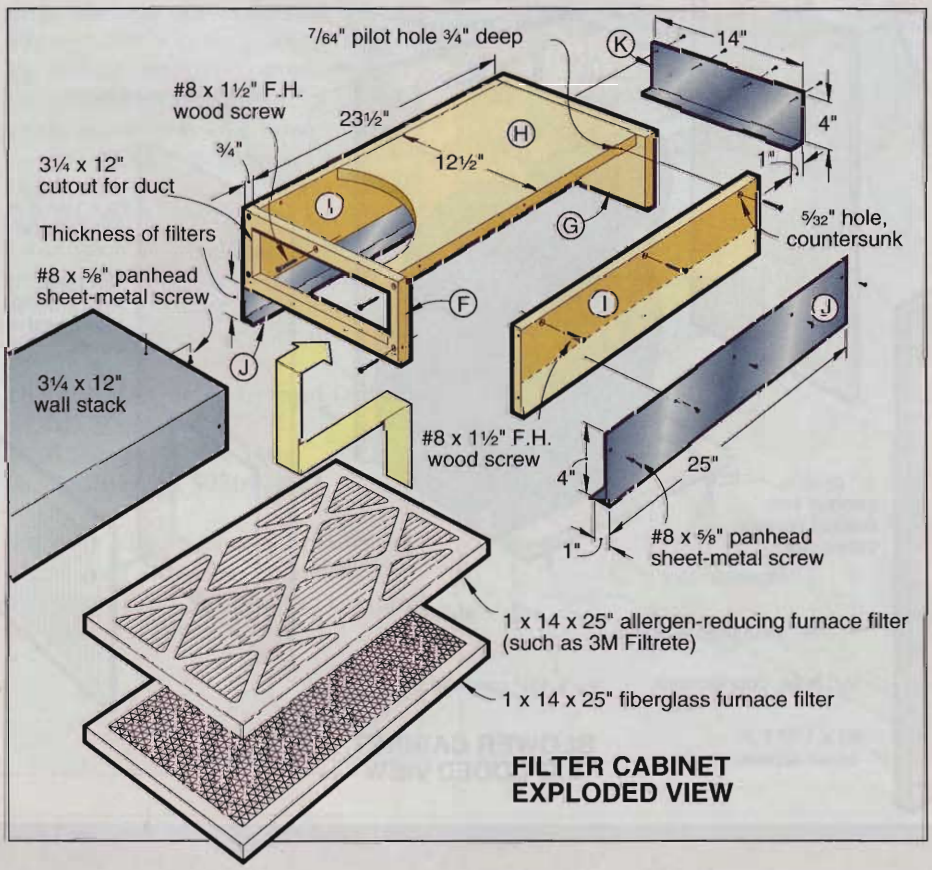
Finally, hang your unit and run ductwork

1 With a helper, lift the blower cabinet to its mounting location and attach it to the joists using 5/16×2" carriage bolts, flat washers, lock washers, and nuts.

2 Wire the blower/motor and switch to a shop circuit as described in the blower's manual. (For safety sake, if you're not familiar with wiring, hire a qualified electrician.) Attach the remaining side (E) to the cabinet.

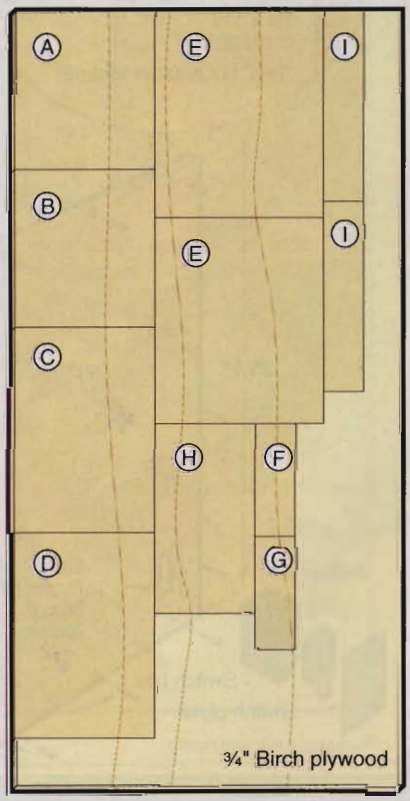
3 Assemble enough lengths of 3¼×12" wall stack to reach from the blower cabinet to the filter cabinet location.





FILTER CABINET EXPLODED VIEW

CUTTING DIAGRAM



Join the segments and attach them to the ceiling.

4 Mount the filter cabinet to the ceiling, and affix the wall stack to the opening with #8×⅝" panhead sheet-metal screws. Seal the joint between the wall stack and cabinet with caulk.

5 Stack the allergen and fiberglass filters and install them in the filter tracks as shown in the Filter Cabinet Exploded View. Periodically vacuum dust from the filter. And if you notice a substantial reduction in airflow, replace both filters.

Written by Dave Campbell
Project Design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: Baldwin Photography

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
BLOWER CABINET					
A bottom	¾"	16"	19½"	BP	1
B top	¾"	16"	19½"	BP	1
C front	¾"	16"	25½"	BP	1
D back	¾"	16"	25½"	BP	1
E sides	¾"	21"	25½"	BP	2
FILTER CABINET					
F front	¾"	5"	14"	BP	1
G back	¾"	5"	14"	BP	1
H top	¾"	12½"	23½	BP	1
I sides	¾"	5"	23½"	BP	2
J side filter tracks	standard gauge	5"	25"	F	2
K back filter track	standard gauge	5"	14"	F	1

Materials key: BP-Birch plywood, F-Galvanized metal flashing

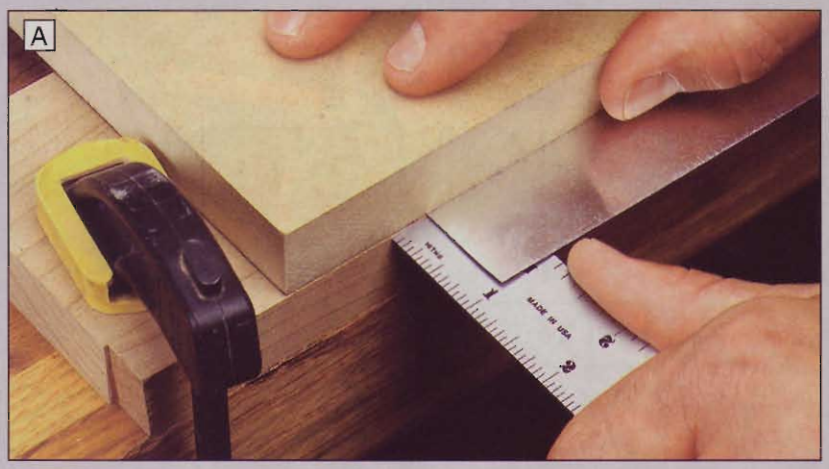
Supplies: 3¼×6×12" rectangular stackhead; 3¼×12" wall stack; universal tailpipe hangers (4); ½" flexible electrical conduit; ½" flexible conduit connector; switch box or junction box; switch plate or junction box cover; switch; 5/16×1¼" carriage bolts, flat washers, and nuts; 5/16×2" carriage bolts, flat washers, lock washers, and nuts; 5/16×1½" carriage bolts, flat washers, and nuts; 14×14" air return grille; #8×1½" flathead wood screws; #8×⅝" panhead sheet-metal screws; 1×14×25" allergen-reducing furnace filter; 1×14×25" fiberglass furnace filter; acrylic caulk.

Buying guide

Blower/motor. 10⅝" double-inlet belt-drive blower with ¼ hp. motor and 1,680 cfm free-air delivery, W.W. Grainger stock no. 7C656, about $160. For the location of a Grainger branch near you, call 847/647-8900 or visit www.grainger.com.

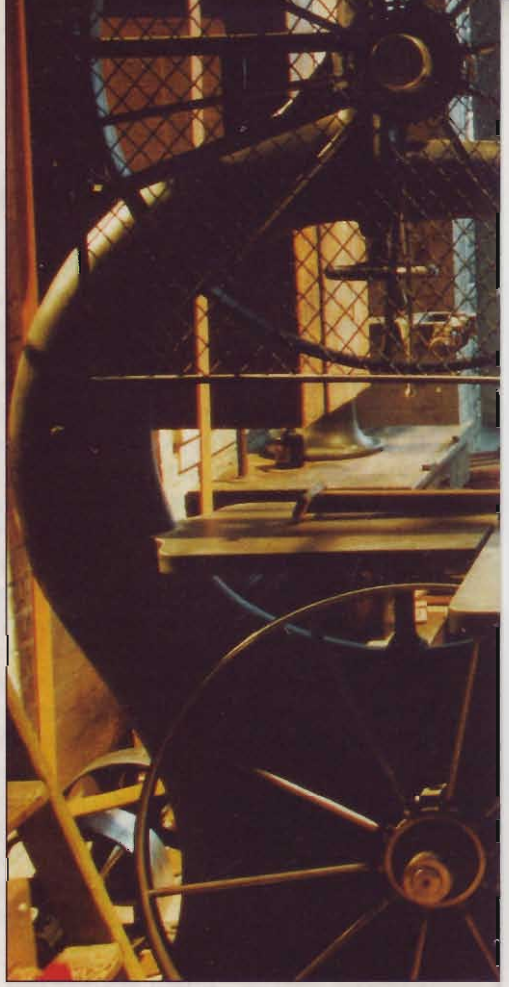
Putting on the brakes

You don't need a box full of special tools to make crisp corners in sheet metal. With a few straight scraps of wood, a hammer, and the instructions *below*, you'll be on your way to bending (or "braking") sheet metal with professional-looking results.



Clamp the sheet-metal workpiece between a pair of straight-edged wood scraps, leaving the portion you want bent hanging out of the "sandwich", and aligning the brake line with the edges of both scraps (*Photo A*). Using a block of flat scrap, first bend the metal gently by hand. Then, tap the block along the brake line (*Photo B*), to get a taut corner like that shown in *Photo C*.

12 TOP VACATION STOPS FOR ADVENTUROUS WOODWORKERS



Ever consider tying your vacation—or at least part of it—to your favorite hobby? We've found a dozen good bets for you. (Even your nonwoodworking spouse and children should enjoy them.)

1 The best of Shaker

Widely considered the greatest and most complete collection of Shaker artifacts, the Shaker Museum and Library at Old Chatham, New York, rates as a must see. Unlike the Shaker villages, such as Hancock in Massachusetts, or Spring Hill in Kentucky, which are touristy "living history" facilities, the Shaker Museum and Library has comprehensive collections representing Shaker life and industries. These span 200 years of history and represent every known Shaker community.

There you'll find all sizes and forms of Shaker rocking chairs, plus tables, chests, boxes, and other household items. A big plus is the woodworking tools and machinery, set up as the Shakers would have used them. Included is the first circular saw blade, invented by Sister Tabatha Babbit of the Harvard Shakers in 1810.

Shaker Museum and Library, 88 Shaker Museum Rd., Old Chatham, NY 12136. Open Thurs.–Mon., May–Nov., 10 a.m. to 5 p.m. Adults $8, seniors. $7, children 8–17 $4. Phone 518/794-9100.

Shaker Museum and Library, Old Chatham, New York; Michael Fredericks, photographer

In 1813, the Shakers of Mount Lebanon, New York, used this jigsaw fashioned from a sewing machine treadle and frame to make pail bottoms and other round objects. A piston pump even blows sawdust out of the kerf.

2 It was called Furniture City

At the turn of the century, Grand Rapids, Michigan, boasted nearly 800 furniture manufacturers. Albert and John George Stickley, two of the five Stickley brothers, produced their "Quaint Mission" furniture line there. As companies merged in the 1950s and 1960s, most moved south for cheaper labor and a greater wood supply. Luckily for you, the Public Museum of Grand Rapids has preserved this past in its "Furniture City" permanent exhibit at the Van Andel Museum Center. You'll meet the makers, tour a 19th-century factory, and trace 150 years of "product." There's more, such as a 1928 Spillman Engineering Company carousel and an 1890s train station. Minutes away is the museum's victorian Voigt House.

The Public Museum of Grand Rapids, 272 Pearl St., Grand Rapids, MI 49504. Open year round (except Christmas and New Years), Mon.–Sat., 9 a.m. to 5 p.m., Sun., noon to 5 p.m. Adults $5, seniors. $4, children 3–17 $2 . Phone 616/456-3977.

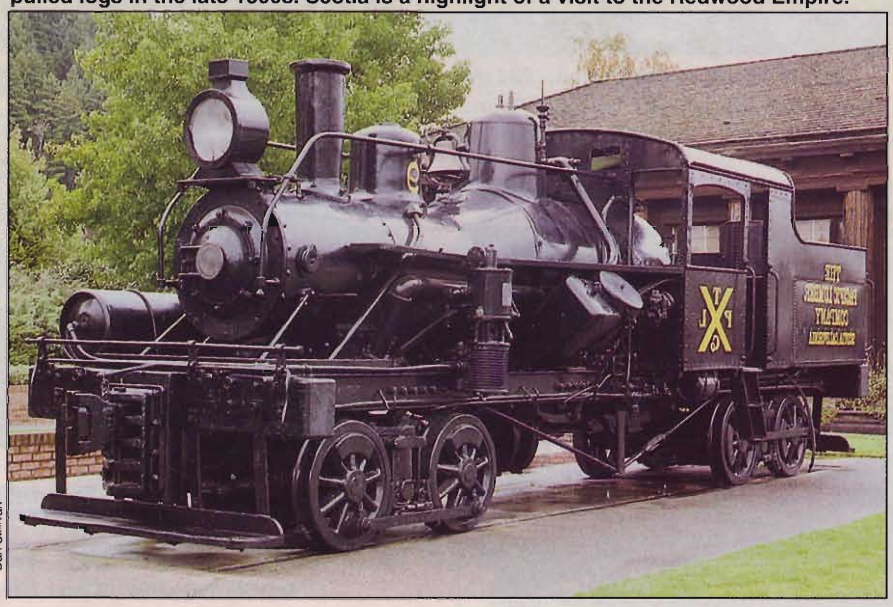
The Public Museum of Grand Rapids, in Grand Rapids, Michigan, has a permanent exhibit highlighting its early furniture industry. In "Furniture City," you'll see the recreation of an 18th-century furniture factory.

Public Museum of Grand Rapids

3 California's redwood country

You may never have heard of Scotia, California, but it's one of the few remaining "company" towns in America. Back in the late 1880s, the town was built by the Pacific Lumber Company (PALCO) for its workers who logged redwood trees and worked in the sawmill. The company erected single-family homes, housing for singles, a library, a general store—just about everything that made up a small town. And it's still there today, along with the gigantic redwood sawmill that offers self-guided tours. There's also a museum that reflects early logging and company history, including an 1882 "steam donkey" that once pulled logs. You'll also like the fisheries exhibit at the aquarium and a demonstration forest a few miles south of town.

Besides Pacific Lumber Company's massive redwood mill in Scotia, California, that offers self-guided tours, there's a logging museum featuring this steam engine that pulled logs in the late 1800s. Scotia is a highlight of a visit to the Redwood Empire.



Dan Sullivan

To see some really big redwoods, follow the Avenue of the Giants (old U.S. 101) from Stafford (just south of Scotia) to Sylvandale. Along the 31-mile stretch, you'll see a redwood with a road through it, and several named and protected redwood groves, such as Founders, Bolling, and Pioneer. You'll long remember this land of giants, the only place on earth where redwoods grow.

Pacific Lumber Co. sawmill, Scotia, California. Open all year; free tours Mon.–Fri., 8 a.m. to 2 p.m. Scotia Museum, summer through early fall, Mon.–Fri., 8 a.m. to 4:30 p.m., free. PALCO demonstration forest, open summers only, every day, 8 a.m. to 4:30 p.m., free. Phone 707/764-2222.

Continued

The Ward Museum of Wildfowl Art

The Decoy Study Gallery at the Ward Museum of Wildfowl Art lets visitors explore more than a century of regional decoys from North America's major flyways.

4 They look like they'd fly

There's a hard-to-describe charm about Maryland's Eastern Shore that goes beyond boats, fresh seafood, and views of Chesapeake Bay. But at The Ward Museum of Wildfowl Art, in Salisbury, it's easy to name: unbelievable carving. Decorative wildfowl carving started with Lem and Steve Ward, two Eastern Shore wildfowl hunters turned craftsmen, and the museum carries their name. To do them justice, the Ward Museum exhibits a major collection of world-class carvings of everything from working decoys to decorative geese and colorful, lifelike songbirds. In the Decoy Study Gallery, you can trace 100 years of decoys from the nation's flyways. You'll find sculpture, paintings, and prints, too, as well as a museum store selling antique decoys and other gifts and collectibiles.

The Ward Museum of Wildfowl Art, 909 S. Schumaker Dr., Salisbury, MD 21804. Open all year, Mon.–Sat.,10 a.m. to 5 p.m., Sun., noon to 5 p.m. Adults $7, tour rates available. Phone 410/742-4988.

5 A woodcraft capitol

Nestled in the Appalachian Mountain foothills, Berea, Kentucky, has more than a fair share of woodworkers and other craftspeople for a town of 10,000. Members of The Studio Craftspeople of Berea publish a tour map and welcome visitors to their work places. Working in wood, there are spoon makers (treenware), musical instrument makers, chairmakers, general furniture builders, turners (Rudy Osolnick calls Berea home), and a host of others. Most are situated in Old Town. Stop at the Berea Welcome Center for directions to woodworkers' shops.

Another Berea highlight is the student production of Berea College Crafts. You'll find retail outlets at the Log House on campus and at the Boone Tavern gift shop.

Berea Tourist Commission, 201 N. Broadway, Berea, KY 40403. Phone 800/598-5263.

Chairmaker Brian Boggs welcomes visitors to his woodworking shop and gallery in Old Town, as do most of the talented craftspeople in Berea, Kentucky.

Berea Tourist Commission

The Shelburne Museum

At the Shelburne Museum, you'll see exhibits, such as this wall of early woodworking tools, with each tool identified.

The Minnesota Historical Society

At the Forest History Center, a driver in period costume directs his draft horse with "gees" and "haws" to load logs in the recreated logging camp.

6 A logging camp revived

What was life like as a turn-of-the-century logger in northern Minnesota? You can find out at the Forest History Center in Grand Rapids, operated by the Minnesota Historical Society. There, costumed performers play character roles in an authentic 1900 logging camp. A saw filer sharpens big two-man crosscut saws. Lumberjacks chop. And horse teams drag logs. Walk down to the wanigan in a bay of the Mississippi River. It's a replica of a barge-like boat that served as cook shack on river drives. To take a break, sit on the porch of a 1934 patrolman's cabin in the Minnesota Forest Service complex and listen to a costumed ranger describe the role he played. In an interpretive museum, you'll learn about early logging and northern forests through interactive exhibits. The third weekend in July there's a woodcrafts festival, featuring items made only with hand tools.

For the activity-oriented, you can hike 2.5 miles of nature trails. By the way, the 1.6 million-acre Chippewa National Forest with over 700 lakes, 920 miles of streams, and 23 campgrounds borders Grand Rapids.

Forest History Center, 2609 Cty Rd. 76, Grand Rapids, MN 55744. May 25 through Oct. 15, Mon.–Sat., 10 a.m. to 5 p.m., Sun., noon to 5 p.m. Museum and trails open all year. Adults $5, seniors $4, children 6–15 $3. Phone 218/327-4482.

7 America's classic furniture

You can easily spend a whole day viewing the foremost collection of classic American furniture at Winterthur Museum, Garden & Library near Wilmington, Delaware. Built by the du Pont family in the early 1800s, Winterthur houses the furniture, paintings, and other decorative objects—89,000 pieces— gathered by Henry Francis du Pont over his lifetime. You'll see the finest examples of American furniture and cabinetwork from 1640 to 1860, and textiles, metalwork, prints, ceramics, and glass. The grounds contain lavish gardens.

Woodworkers find the Dominy Shops especially intriguing. They're reconstructions of shops used by the Dominy family craftsmen of New York from the mid-1700s to the mid-1800s. The exhibit includes furniture, machinery, and 800 of their tools.

Winterthur Museum, Garden & Library, Winterthur, DE 19735. All year (except winter holidays) Mon.–Sat., 9 a.m. to 5 p.m., Sun., noon to 5 p.m. Library: Mon.–Fri., 8:30 a.m. to 4:30 p.m. Adults $8, seniors/students $6, children 5–11 $4. Call for special tour prices. Phone 800/448-3883.

8 Shelburne has the tools

The Shelburne Museum in Shelburne, Vermont, has 37 fascinating exhibition buildings housing more than 80,000 objects of Americana. And the setting is 45 hilly acres overlooking Lake Champlain. In a day or more, you'll want to examine Shelburne's collection of woodworking tools, totaling upward of 1,600! Among them are the tools required to build the average home and its furniture of 150 years ago. Other collections include decoys, weather vanes, carriages, and circus memorabilia. There's a water-powered sawmill, too.

The Shelburne Museum, U.S. Rt. 7, P.O. Box 10, Shelburne, VT 05482. All bldgs. open late May through Oct., daily 10 a.m. to 5 p.m. Adults, $17.50, children 6–14, $7. For full schedule, call 802/985-3346.

If you're in the area

Continued

12 TOP VACATION STOPS

9 The dean of American Craftsmen

Designer and wood craftsman Wharton Esherick died in 1970 at age 83. But his pioneering work of the 1930s in contemporary, hand-crafted furniture and interiors was heralded by the national art and design community. He was called the "dean of American craftsmen," and his work led the 1960s' renaissance that made hand craftsmanship as valued as it is today.

Esherick lived on a mountain top outside Paoli, Pennsylvania, in a home and workshop that he designed and built. In relative isolation, he pursued working wood during a time when our culture frowned upon hand-crafted things.

In the architecturally unique complex, you'll see his sculpture and sculptured furniture, living quarters and work room, and his carvings. An exhibit traces his work and influence on American wood craftsmen.

The Wharton Esherick Museum, P.O. Box 595, Paoli, PA 19301. (Near Valley Forge National Historic Park.) Open Mar. through Dec. Group tours, Mon.–Fri., 10 a.m. to 4 p.m.; Sat., 10 a.m. to 5 p.m.; Sun., by reservation only, 1 p.m. to 5 p.m. Admission: $6, children under 12, $3. Reservation required. Call 610/644-5822.

The unusual spiral staircase crafted from oak by Wharton Esherick is one of many unique features you'll discover at his home and studio near Valley Forge, Pennsylvania.

Wharton Esherick Museum

10 Colonial life as it was

Sure, you've heard of Colonial Williamsburg. That's where the master of the old hand ways, Roy Underhill, hangs out. It's also where you'll see all the old trades as they once were practiced, from cabinetmaking to coopering, wheelwrighting, gunsmithing, and instrument making. And these pre-Revolutionary craftsmen work in a realistic, authentic setting that puts Colonial Williamsburg at the top of the nation's living history attractions. But that's not all. There's collection upon collection (and building after building) of preserved period furniture.

Unfortunately, you can't see all that Colonial Williamsburg has to offer in a day. You'll want to stay in one of the official hotels in Colonial Williamsburg, but they book up fast.

Colonial Williamsburg

At Jonathan Haye's cabinet shop in Colonial Williamsburg, craftsmen in period costume build furniture as they would have in the 1700s.

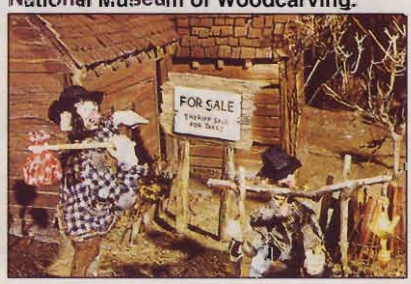
Colonial Williamsburg, P.O. Box 1776, Williamsburg, VA 23187-1776. Open daily, 9:30 a.m. to 5 p.m. (some sites may differ). Ticket prices start at $31 for adults, children's tickets, ages 6–17, $18. For details and help in planning your visit, call 800/HISTORY (800/447-8679).

11 Wood comes alive here

To the west of Custer State Park, in South Dakota's Black Hills, you'll find a display of woodcarvings unlike anything you've ever seen. As an example, the National Museum of Woodcarving exhibits thousands of lifelike wooden scenes created by one of Disneyland's original animators. Beyond that, there's the encompassing work of 70 nationally known woodcarvers—western figures, buffalo, elk, cartoon caricatures, and more. And a resident woodcarver works right before you. With advance reservation, you can stay a day or two and take a carving class.

National Museum of Woodcarving, Hwy 16 W, P.O. Box 747, Custer, SD 57730. Open June, July, and Aug., 8 a.m. to 8:30 p.m. May, Sept., and Oct., 9 a.m. to 5 p.m. Adults $5.75, children 6–14 $3.75. Phone 605/673-4404.

Lifelike scenes, large and small, fill the National Museum of Woodcarving.



National Museum of Woodcarving

12 A shrine of pine

Near Baldwin, in western Michigan, there's a special place. Lake County Park is pleasant, but it's the Shrine of the Pines there that makes it special. It showcases the skill of a 1920s guide and woodsman who created a building and filled it with rustic furniture without the aid of power tools, nails, or screws!

Ray Overholzer retrieved logging leftovers and turned them into such things as a perfectly balanced rocker and a table crafted from a 700-pound stump. Before his death in 1952, he had turned his collection into a museum, now operated by the county.

Shrine of the Pines, Lake County Park, Michigan Route 37, two miles south of Baldwin, Michigan. May 15–Oct. 15, Mon.–Sat.,10 a.m. to 6 p.m.; Sun. 1:30 p.m. to 6 p.m. Adults $3.75, seniors $3, children 6–13 $1. Special family rate. For more information, phone 231/745-7892.

Got a trip tip?

If you've had a memorable vacation stop that you feel would interest other woodworkers, we'd like to hear about it. Drop a note briefly describing what you saw, what it's called, where it is, and other pertinent information to:

Travel Tips
WOOD® magazine
1716 Locust St., GA310
Des Moines, IA 50309-3023

Written by Peter J. Stephano
Illustration: Brian Jensen

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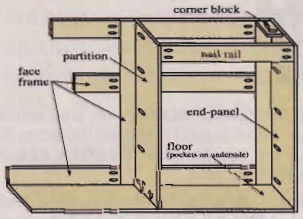

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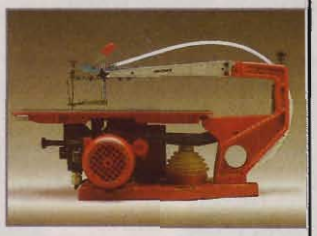

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Okay, we confess: If you're wondering whether we have an ulterior motive for including personal home pages in WOOD ONLINE's mix of discussion groups, wood profiles, classifieds, Idea Shop tours, tool talk, and other features—well, you're right. Home pages give us an excellent opportunity to learn more about who our readers are and how we can better serve you.

And lest you think it's a one-way street, be advised that you can also visit home pages from quite a few WOOD® magazine staffers. View their home pages to find out what Senior Editor Larry Johnston means when he says he's doing a restoration on his 1966 Mustang, or see a photo of Design Editor Jim Downing's hand-crafted 30' sailboat.

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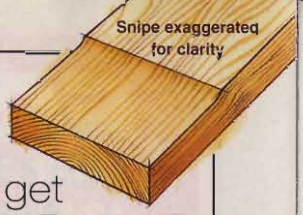


Planer Snipe

How to get the UPPER HAND

As *WOOD*® magazine tool tester Dave Henderson discovered during his review of portable planers (see *page 56*), it's impossible to totally eliminate snipe on the ends of planed boards. (Snipe is the slight dishing of the planed surface at both ends of a board caused by the planer's cutterhead taking a too-deep cut.)

The causes of such snipe—some are operator related but most are mechanical in nature—can be minimized by properly setting up the machine according to the manufacturer's instructions. But even after doing that, Dave found that some of the tested planers produced in excess of .004" of snipe—too much for our tastes. To get your machine to produce less than .002" of snipe (at that depth you can easily sand the board so the snipe can't be seen or felt), Dave suggests the following strategies:

- Dull knives tend to lift the ends of workpieces (which increases snipe) as the board enters and exits the planer. So keep your knives sharp.
- The deeper the cut, the worse the snipe. So take light cuts (1/32" or 1/64" deep) on your final planing passes.
- It helps to raise the outside ends of the extension tables just a few thousandths of an inch above the main table. Every planer is different, so do some experimenting with scrap stock.
- If you butt your boards end-to-end as you plane them, the snipe will show up only on the entry end of the first piece and the exit end of the final piece. If those ends are checked, you lose no stock due to snipe because you would have cut them away regardless.
- You can take the above tip one step further by butting scrap stock at least 10" long against the entry and exit ends of one or more pieces of stock. This will eliminate snipe on your good pieces altogether, provided the thickness of the scrap pieces precisely matches the good stock.
- Finally, for shorter pieces of highly figured or expensive stock, Dave glues a pair of scrap strips to both edges of a workpiece as illustrated *below*. Like the scrap boards in the previous tips, the strips preload the cutterhead and take the snipe instead of the good workpiece. The 1"-wide strips should be the same thickness, or slightly thicker, and about 8" longer than the workpiece. After completing the planing, rip away the strips.

"Woody" Beetle wows the crowd

Steelcase, the world's largest designer and manufacturer of office furnishings, unveiled a real crowd stopper at the NeoCon furniture and design trade show in Chicago last June. To highlight its new Tableau Collection of wood veneer and natural stone wrapped casegoods, the Grand Rapids, Michigan-based company displayed a 1999 Volkswagen Beetle decked out in wood.

The inspiration of designer Lauren Rottet, who created Steelcase's show exhibit, the Beetle features exterior panels of crotch-figured mahogany against a metallic silver body color. In the black leather interior, matching wood surrounds the speedometer and door pulls. The gear-shift knob and shift casing also are made of crotch mahogany.

"Our goal was to dispel the notion that wood is too traditional or formal for work environments," said Adolph Bessler, vice president and general manager of wood furniture at Steelcase. "The Volkswagen in particular, and the showroom overall, really demonstrate the versatility of our design capabilities."

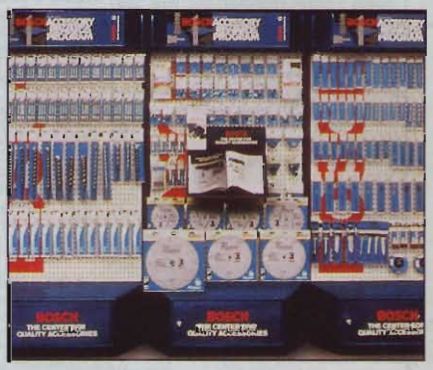
Displayed at a national furniture and design trade show last June in Chicago, this Volkswagen Beetle sports figured mahogany "woody" panels. The custom interior also has accents done in mahogany.

Points for purchases

Bosch Power Tools has borrowed a marketing program often used by supermarkets and cigarette manufacturers—redeemable points for product purchases. The Chicago-based company believes its program to be a tool-industry first.

According to Bosch, the Accessory Rewards Program enables professional tradesmen and serious woodworkers to accumulate points based on the purchase of Bosch power tool accessories. They then can redeem them for free Bosch-branded merchandise, such as jackets, sports bags, coolers, watches, and more.

Program membership applications are available wherever Bosch products are sold. You also can enroll by visiting the company's web site: www.boschtools.com.



In-store displays like this promote Bosch Power Tools' new program that bestows redeemable points for purchasing power tool accessories.

Tomorrow's woodworkers build today

In Lewisville, Texas, there's a yearnin' for learnin' woodworkin' among teenagers. And Joe Davis, the mill and cabinetmaking instructor at the Lewisville school district's Dale Jackson Career Center, has the proof.

"Because of my students' dedication to this program, I have one that continues to grow in a time when most schools are closing down theirs [wood shop programs]," Joe wrote with evident pride. He has good reason, too.

Every semester, the instructor and senior high school students devote two weeks to a production project. In the fall of 1998, the project was to build four computer desks (shown *below*). This was accomplished by dividing the 14 students into two teams, each with a foreman. The teams were responsible for designing, planning, and constructing the different parts of the project. "Then hopefully at the end, the different parts fit into a saleable product," says their instructor. They did—two were sold and two were retained by the school.

Instructor Joe Davis, far right, poses with his Dale Jackson Career Center woodworking students. They built four oak computer desks in two weeks.

Some trees may be doomed

According to the World Conservation Monitoring Centre and the World Wildlife Fund of Washington, D.C., 10 percent of the world's tree species face extinction. Scientists estimate that the world has between 80,000 and 100,000 tree species, with 8,750 needing significant steps to avoid their extinction.

The United States has 259 of the endangered species, and ranks 12th of all nations in this category. The threatened species in the U.S. include the Florida yew and Georgia's stinking cedar.

Photographs: VW by Lambros Photography; students, courtesy of Lewisville Independent School District; Bosch display courtesy of DeFrancesco-Goodfriend